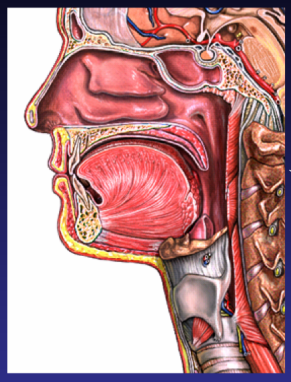
Head & Neck Cancer

II. Putting the Pieces Together



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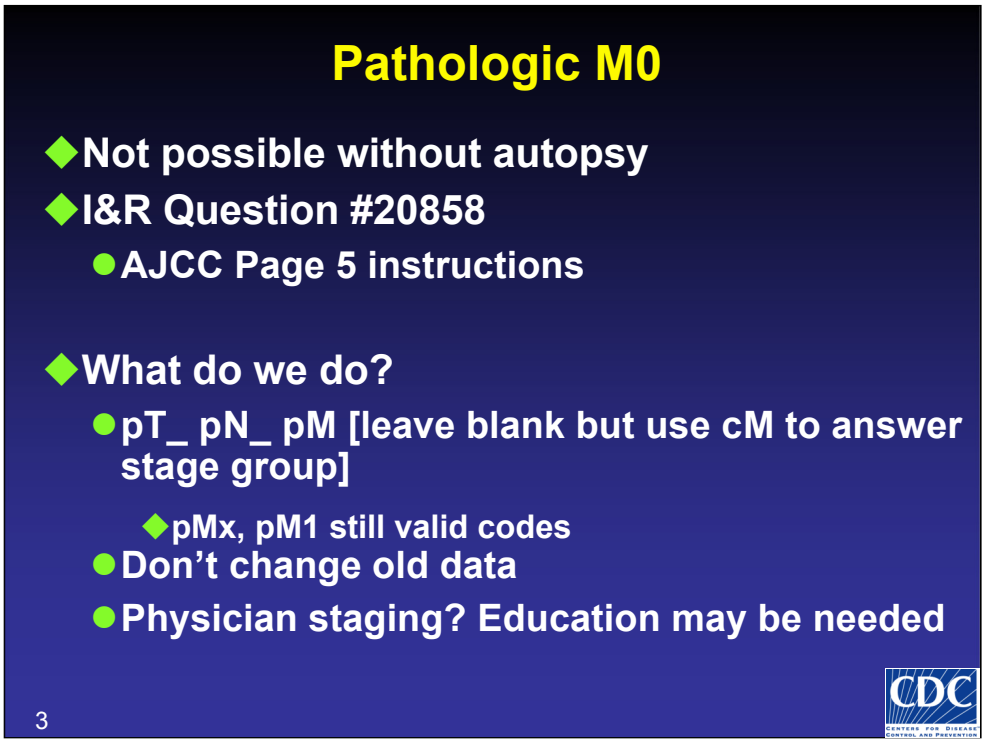
This part of the Head and Neck Advanced Abstracting module covers site-specific anatomy and staging issues (including AJCC and Collaborative Stage). Just a warning, some of the pictures of the tumors may be unattractive. But for those of us who are visual learners, this might be helpful.

These are the major areas of the head and neck primaries that we will discuss. Within these broad categories are many more individual primary sites. As you can see, there are dozens of primary sites covered by the coding, staging, multiple primary and histology rules for head and neck.

We're going to talk about the anatomy and the collaborative staging issues for each of the sites in the head and neck groups. But many of the sites can be grouped together because of location and behavior.

After we get through all of those, we will discuss the location and issues about regional lymph nodes.

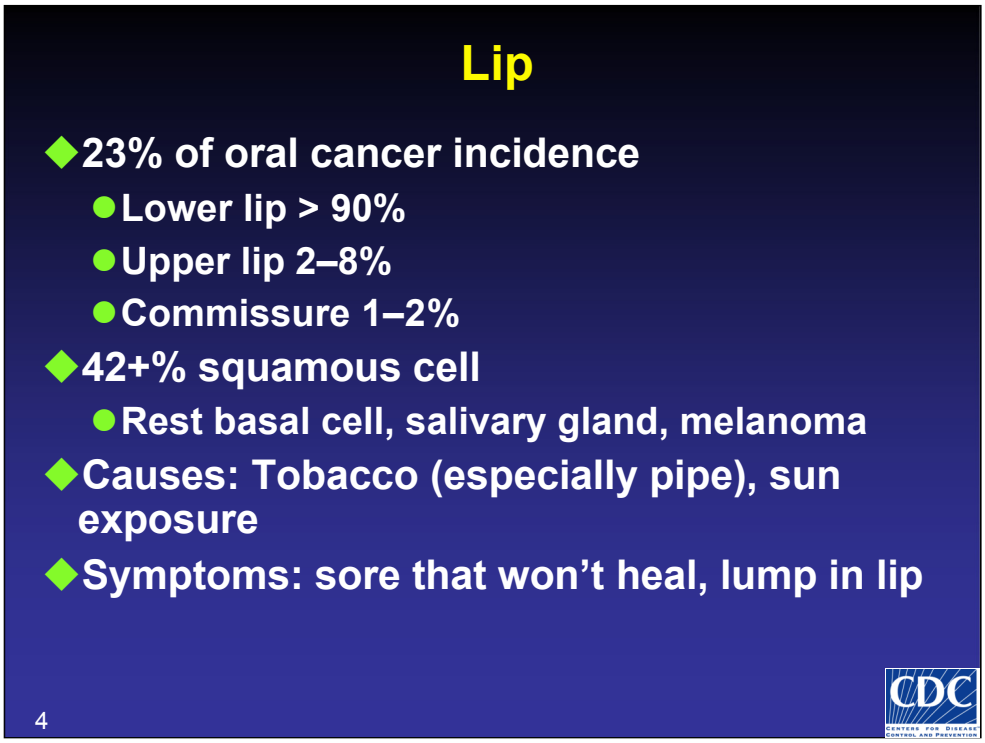
And finally, we'll review the thyroid.



Throughout this lecture, we will review AJCC staging. It has recently come to our attention that many of us might have been committing a normal "error" for years. In discussion with AJCC physicians, it was noted that there is no such thing as pathologic M0 for no metastasis. That would require biopsy of every possible metastatic site within the body (in other words, an autopsy). Even if a biopsy of one suspected site was negative (such as liver biopsy), that doesn't mean there couldn't be a sanctuary or hidden site that had metastasis but was NOT biopsied.

The instructions in the front of the book tell us we can use clinical M information when staging pathologic cases. The problem is that we have linear statements within our computer software. That is, we answer all the pathologic places (T, N, M) OR the clinical places (T, N, M), but there is not a place to mix and match the two. We cannot enter pMx because that would be unknown and cause group stage of "99." Of course, pM1 means distant metastasis was found. So instead, it is recommended that we leave the pM area blank but use the cM information to complete the group stage.

If you have been doing this, what should you do with your old data? Nothing. This was not considered an error by EDITS in the past so it doesn't require a change. Most of us make changes in procedure for the sake of consistency when we begin abstracting a new year. If physicians have been checking the pM box, some education might be required. In the 7th edition of AJCC staging, this will be explained better.

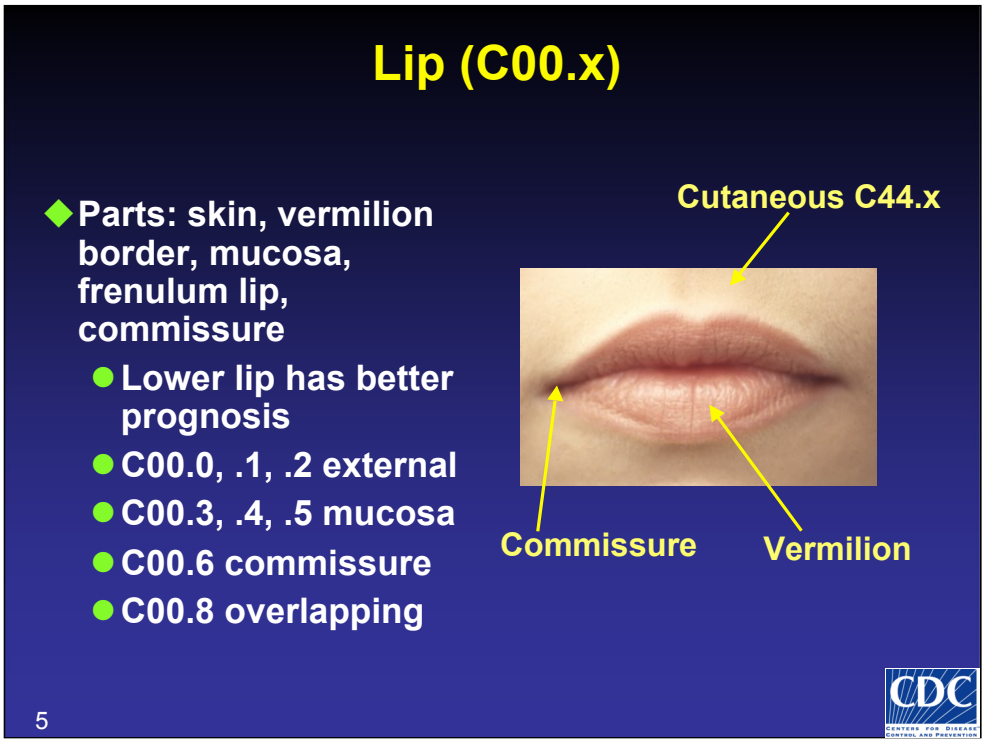


Lip is one of the more common sites in the head and neck. We are not required to abstract skin tumors of the lip. That includes codes 8000 to 8110 and in that group are squamous and basal cell carcinomas. Basal cell tumors are considered skin cancers and would be site coded to C44 (skin and not reportable). Squamous cell cancers can be found on the skin OR the vermilion surface, so you will need to read the operative note carefully to decide if the tumor should be coded C00 vs C44.

Per SEER Inquiry System, review the operative and pathology reports, and the physical exam for mention of "mucosal surface" (reportable) or "skin" (not reportable). If neither are mentioned, lip, NOS, is reportable per the ICD-O-3 code of C009 when it is squamous cell carcinoma.

Reference:

1. Myers EN, Smith MR, Myers J, Hanna E. *Cancer of the Head and Neck,* 4th edition. New York, New York, Saunders, 2003. ISBN-10: 0721694802; ISBN-13: 978-0721694801

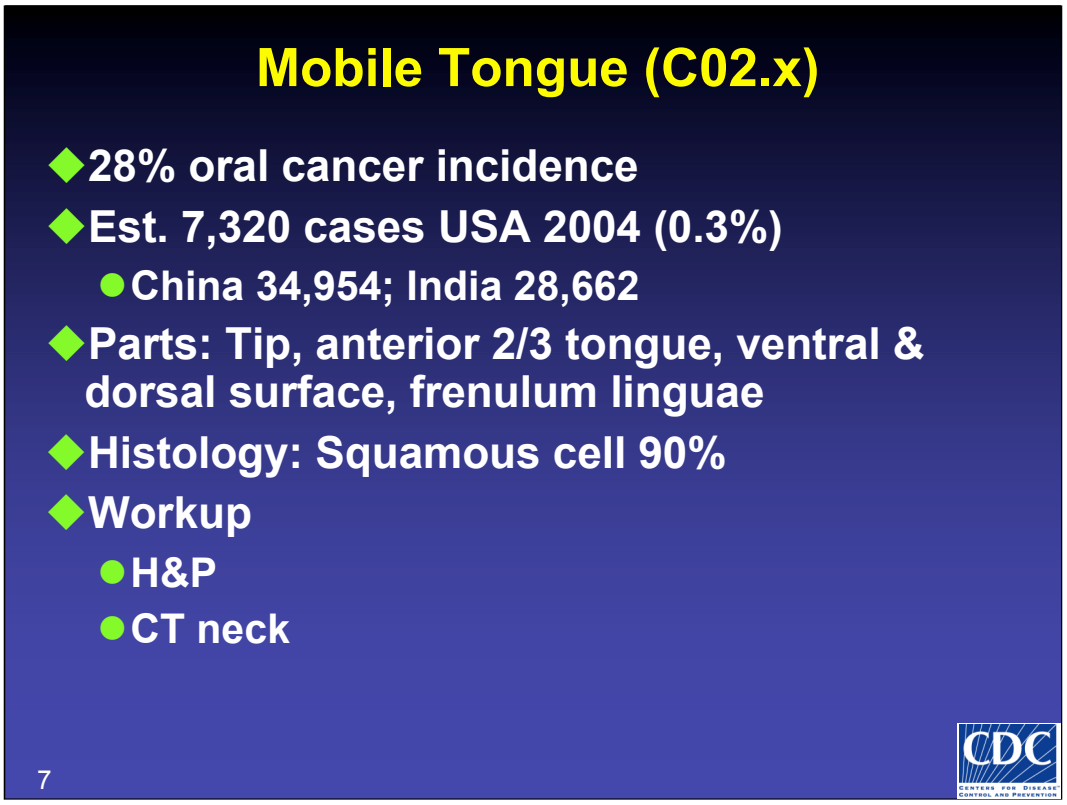


The skin of the lip is covered with *keratinized epithelium* and its underlying tissues contain *sweat glands* (that's why you sweat a lot around your mouth) and *hair follicles.*

The mucous membrane (lining) of the lip is nonkeratinized, and plenty of capillary vessels (blood vessels) are brought close to the translucent surface, thus giving it a red color. This zone also contains occasional sebaceous glands and no sweat glands. That is why it is subjected to drying and needs to be moistened constantly by the tongue.

The vermillion surface is the drier, external portion of the lip. Only humans have a vermilion border. The moister mucous layer faces the teeth. The frenulum is the fold of mucosa that connects the lip to the gum.

We would abstract the lip in the top picture. The bottom is actually on the skin of the lip and wouldn't be abstracted unless your Cancer Committee or state registry says so.

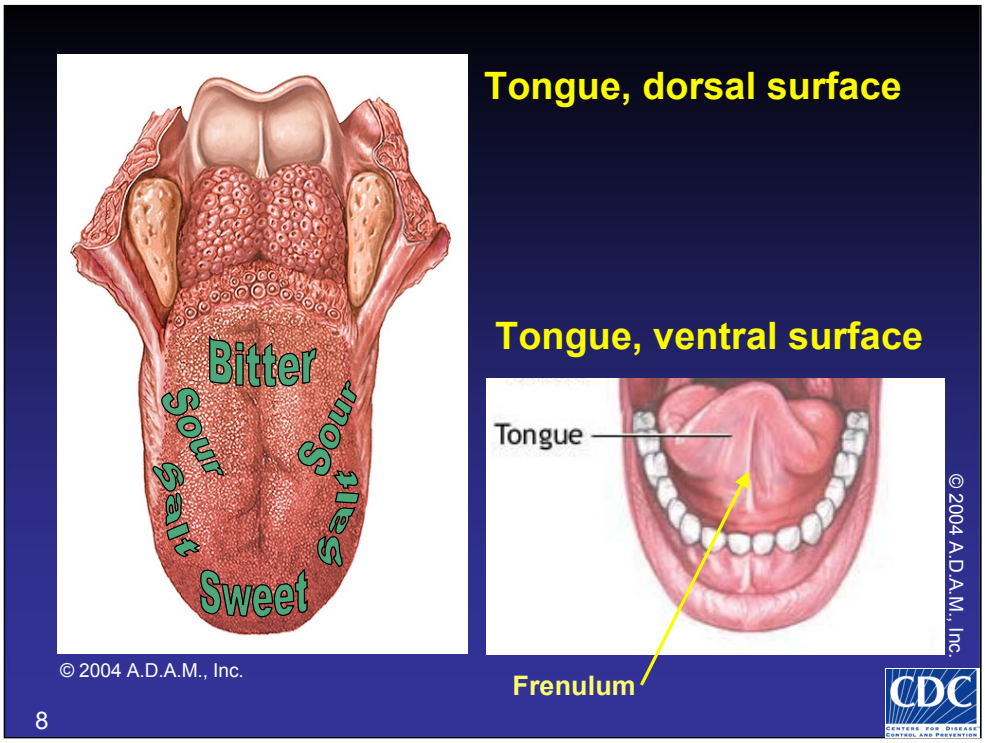


There will be almost 10,000 new cases of mobile tongue cancer in 2007, according to the American Cancer Society, and that is less than 1% of all cancers.

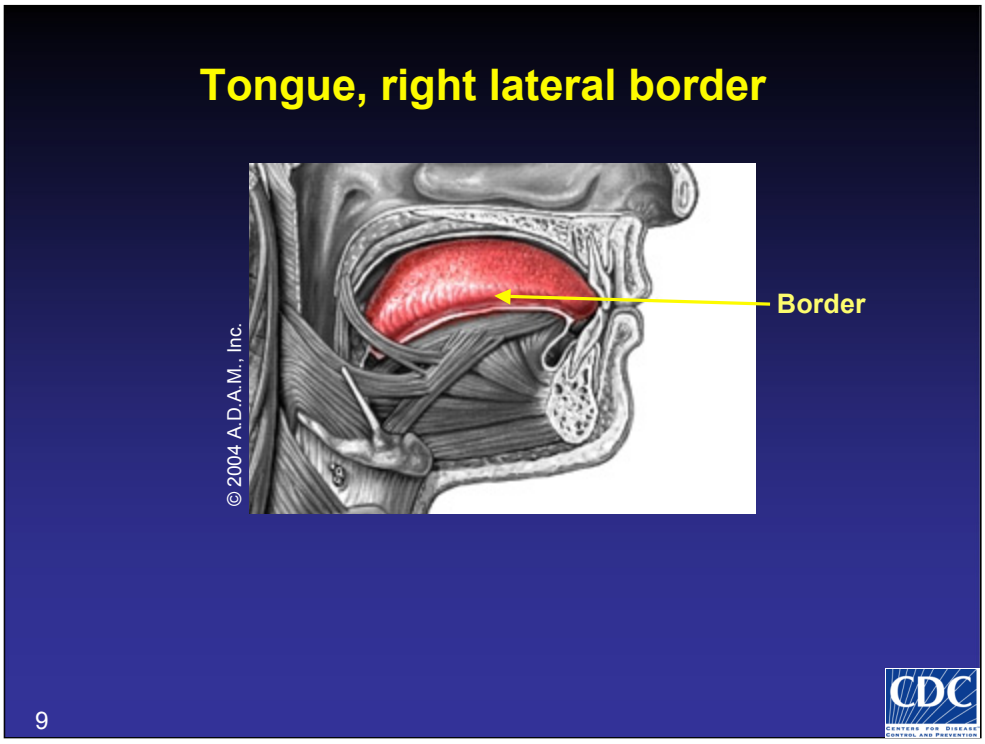
China and India have much higher frequencies of tongue cancer (more than 28,000), but they also have a larger population (more than 1 billion people compared to our 300 million). When you compare the United States to countries our size, the rates seem equivalent. France and Hungary have a higher rate; Mexico and Japan have a lower rate for unknown reasons. “Scientists who study this issue think these differences are caused by environmental risk factors.” (Source: American Cancer Society)

The tongue is a muscle covered with mucosa. The C02 code includes the part of the tongue that is mobile (or the anterior 2/3 of the tongue) and that forms words and sounds. The base of tongue has a different code and is included in another site group (oropharynx). The tip is the part that comes out of the mouth first. The frenulum linguae is the mucous membrane on the ventral surface, midline, that anchors the tongue to the floor of mouth. (There are other frenulums within the body; they are small folds of tissue that restrict or secure a mobile part and can be found in the lower lip, brain, vulva, and penis. Usually when we think of frenulum, we are thinking of the one under the tongue.)

Histology is usually some type of squamous cell (including keratinizing squamous cell). There can also be other types such as sarcomas, Kaposi, etc.



The dorsal surface is the part most often seen, covered with villi and the taste buds. The ventral surface is the mucosal area on the underside, not covered with villi.

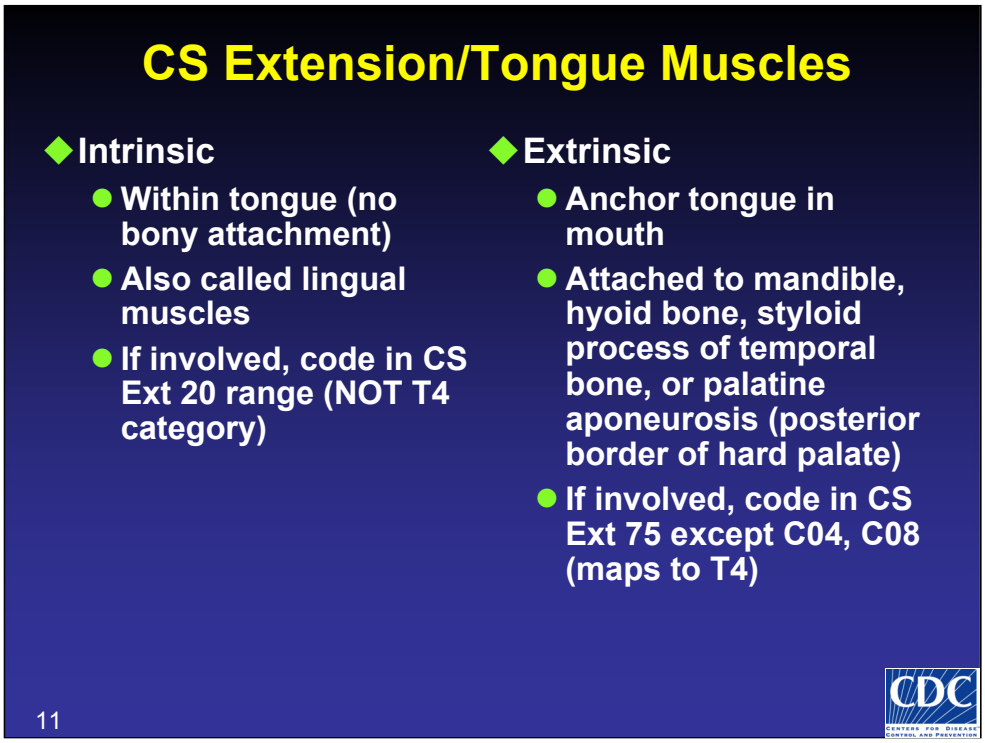


This illustration shows the lateral border of the tongue on the right. Most cancers of the oral tongue occur on the lateral border between the mid and posterior thirds (1).

Reference:

1. Myers EN, Smith MR, Myers J, Hanna E. *Cancer of the Head and Neck*. 4th edition, New York, New York, Saunders, 2003. ISBN-10: 0721694802; ISBN-13: 978-0721694801

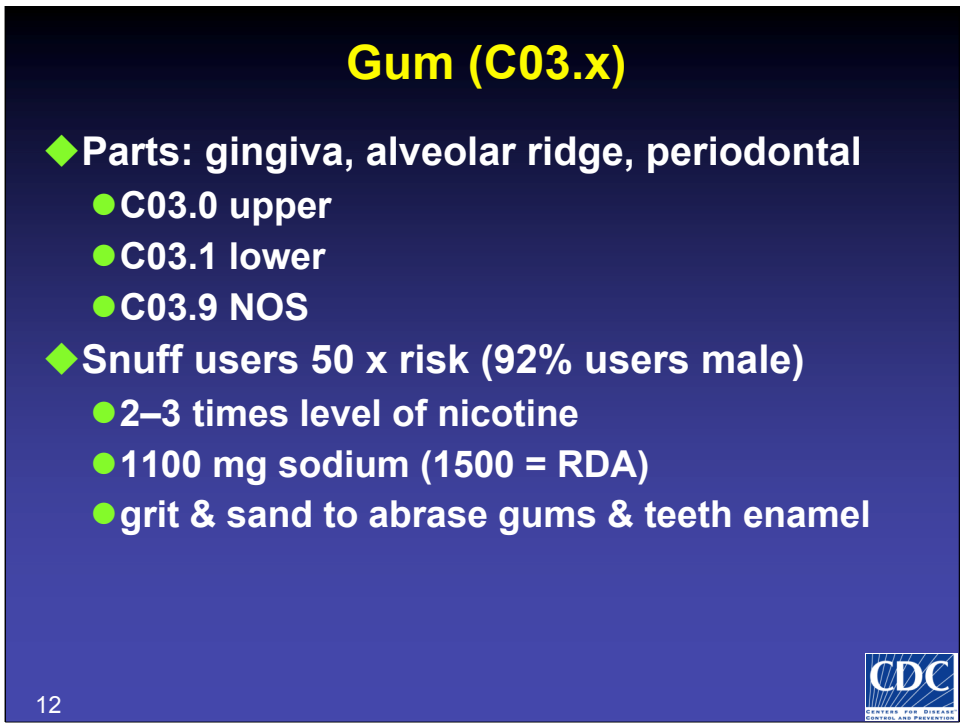
For the visual learners: this is a T1 (less than 3 cm) squamous cell carcinoma of the ventral surface of the tongue.



We need to recognize the different types of muscle within the tongue because they are coded differently for extension in collaborative stage.

The intrinsic muscles of the tongue are used to curl the sides of the tongue upward and form words and sounds.

Involvement of extrinsic or anchoring muscles codes to 70–75 except when it's floor of mouth (C04) and submandibular gland (C08), per the CS Manual.



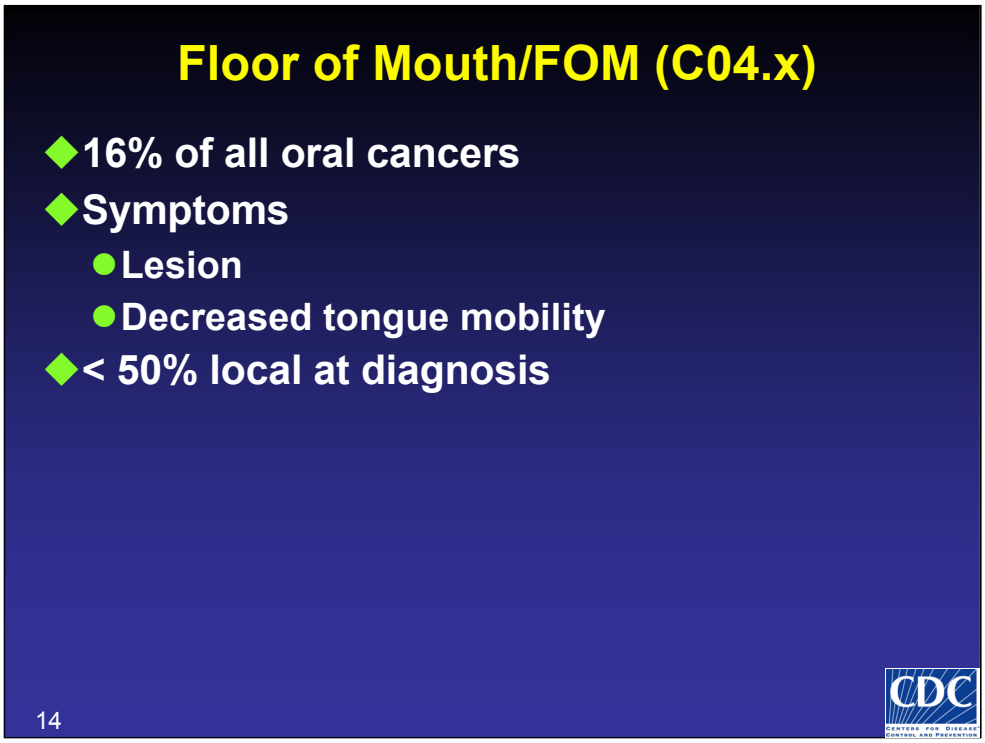
You should recognize all the words on the top line as pertaining to the gum. The alveolar ridge is the part of the gums that contain the tooth sockets. There are different codes for upper versus lower versus unspecified.

Smokeless tobacco is one of the main causative factors for gum cancer. Snuff/chew users are at 50 times the risk of nonusers, and 92% of snuff/chew users are males. There is 2–3 times the level of nicotine in this type of tobacco, which allows teenagers who use it to become hooked much faster. There is 1100 mg sodium (the recommended daily requirement is only 1500 mg). Snuff users don't just use one time a day, so their sodium levels may be outrageous, leading to many other health problems. Some brands contain slivers of glass to cut the gums so the nicotine can enter the bloodstream faster, which leads to scar tissue of the gums, forcing the user to pack it in tighter over time to be able to get that nicotine rush. The grit and sand included not only abrases gums, it destroys tooth enamel. They also add sugar to the snuff to make it taste better, thereby setting up this great area for tooth decay.

Finally, below is a list of some of the poisons found in smokeless tobacco (per the National Oral Health Clearinghouse):

- **nitrosamines:** the most powerful cancer-causing agents in smokeless tobacco
- **polonium 210:** radioactive particles
- **formaldehyde:** embalming fluid
- **cadmium:** a metallic element with poisonous salts
- **arsenic:** another metallic element that forms poisonous compounds

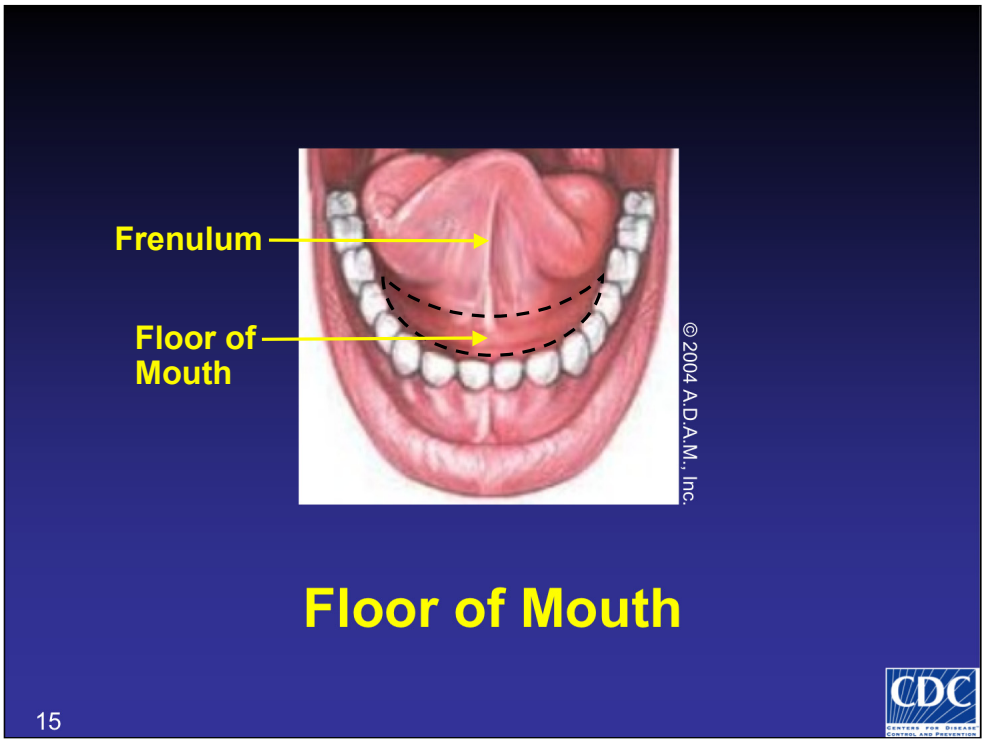
This is what healthy gums should look like. Notice where muscles from the bottom lip are attached to the gum.



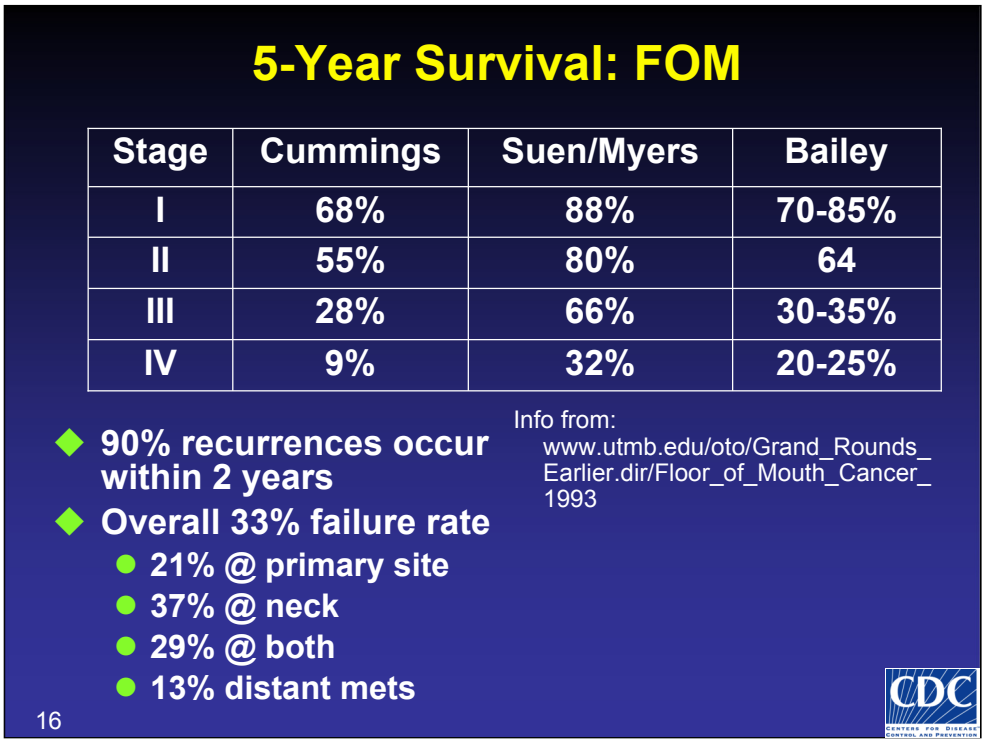
The floor of mouth site is third in terms of incidence for oral cancers, per American Cancer Society statistics.

Unfortunately, by the time such a lesion is reported, the patient may have advanced cancer.

According to an MD Anderson Cancer Center study, approximately 50% of floor of mouth patients have advanced disease either with positive lymph nodes OR regional extension at diagnosis. When we look at the lymph nodes, you'll see that they can be located within millimeters of the floor of the mouth, so it's no wonder they become involved easily. The larger the lesion, the more likely the mandible will be involved. The periosteum of the mandible could offer some resistance to bone involvement, but the tumor will frequently just keep moving into regional tissue.



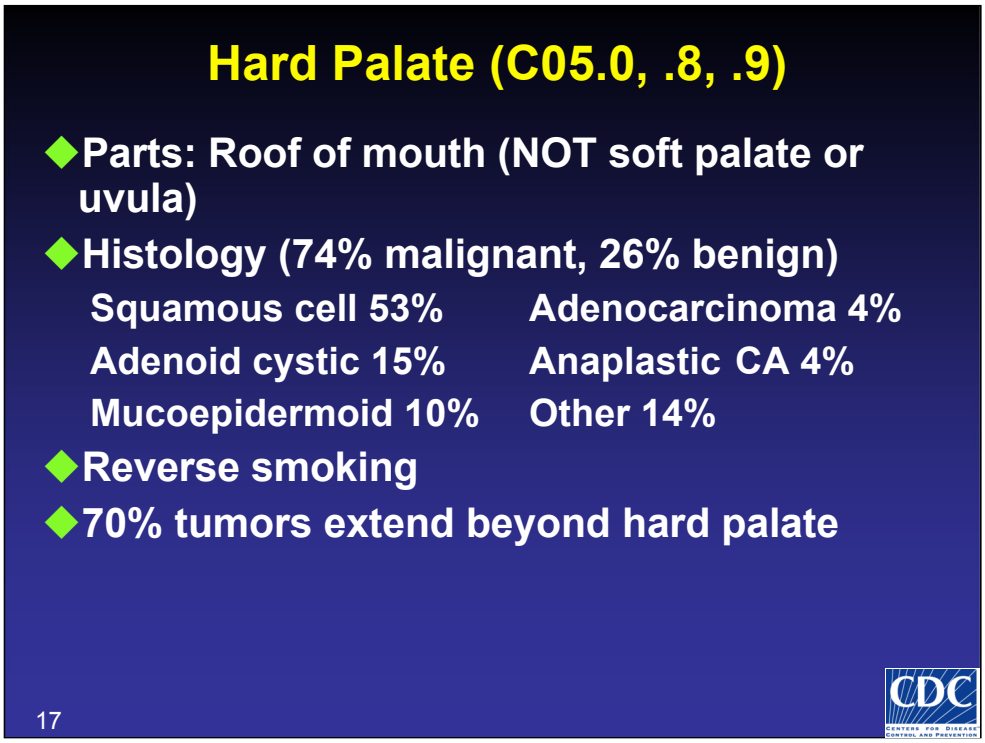
The floor of the mouth is defined as the horseshoe-shaped area around the base of the tongue and includes openings to the submaxillary and sublingual salivary glands.



The University of Texas offered information from Grand Round presentations about floor of mouth cancer. One commenter did not like the classifications within the AJCC's TNM chapters for this site in particular. The T category is based on size of lesion and this physician thought that could be misleading when the "thickness" of the tumor (or depth of invasion) would be a better indicator of tumor outcome. This is an interesting idea and could lead to studies within your registries or indicate a factor that might be considered for future revisions of AJCC staging.

Finding survival information for just floor of mouth was difficult. This grouping of facts was found in a Web site from information prepared by resident physicians in partial fulfillment of educational requirements established for the Postgraduate Training Program of the University of Texas Medical Branch Department of Otolaryngology/Head and Neck Surgery. Note that this study was done in 1993 from textbooks and articles published prior to that.

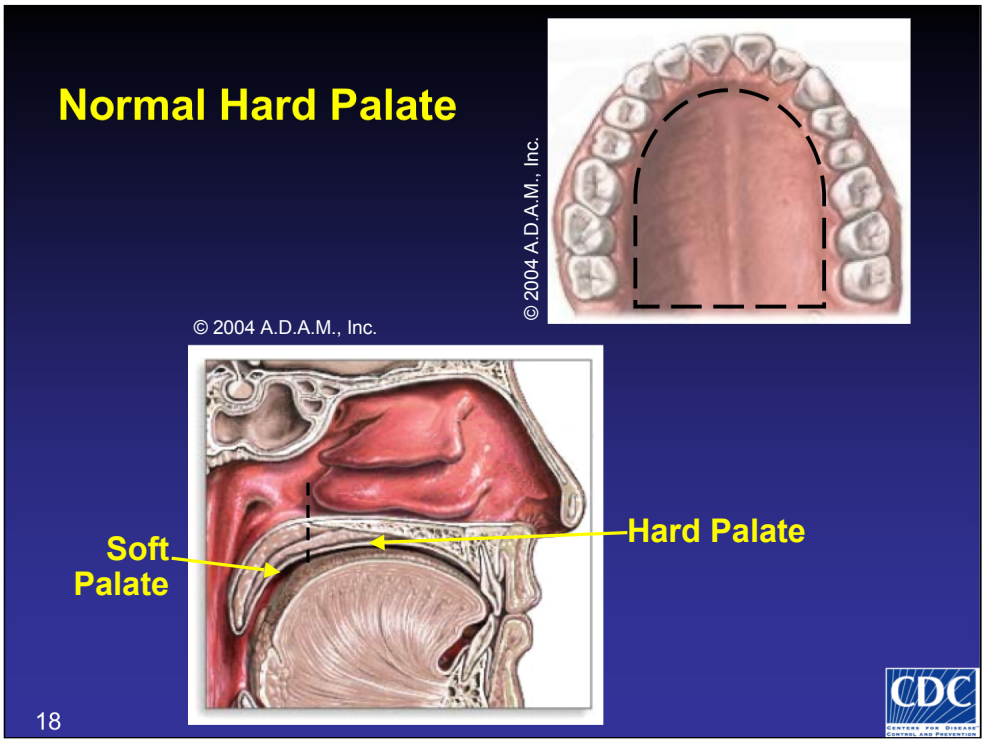
The most interesting part of this paper might be the recurrence and failure rate information. Also noted was that surgical salvage is effective approximately 50% of the time.



When we talk about the hard palate, we are talking about one specific location. It does not include the soft palate or uvula, which are also included in the C05 codes. The function of this organ is to separate the oral cavity from the nasal cavity and maxillary sinuses. Anatomically, the hard part is included in the oral cavity; the soft palate and uvula are considered oropharynx.

Per the WebMD Web site, three-fourths of the tumors in the hard palate are malignant, but benign tumors can arise there. Squamous cell carcinoma makes up the majority of tumors within this site, but not as high a percentage as the other sites we've viewed so far.

One of the causes for cancer in this site might be the reverse smoking habit in some countries which is when the lit end of the cigarette is placed in the mouth so that an intense heat is generated during smoking. Hard palate cancer is 40% incidence of all oral cancers in India, where this is a more common practice.

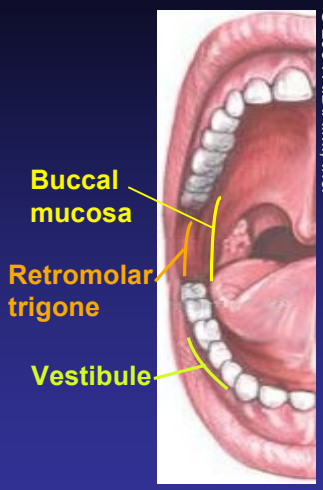


The hard palate is covered by rosy to blue mucosa that is thick, firm, and adherent to underlying bone.

The hard palate is the mucosal covering of the palatine bone in the upper part of the mouth. There is no submucosa or muscularis propria in this site, just direct attachment of the mucosa to the periosteum of the bone.

Cheek/Buccal Mucosa (C06.x)

- **Parts: Cheek, vestibule, alveolar sulcus, retromolar trigone, minor salivary glands NOS**
  - **Page 33 ICD-O-3: Minor salivary gland tumors can be found anywhere in oral cavity & surrounding organs – code to specific site if noted, else code to C06.9 (NOS)**



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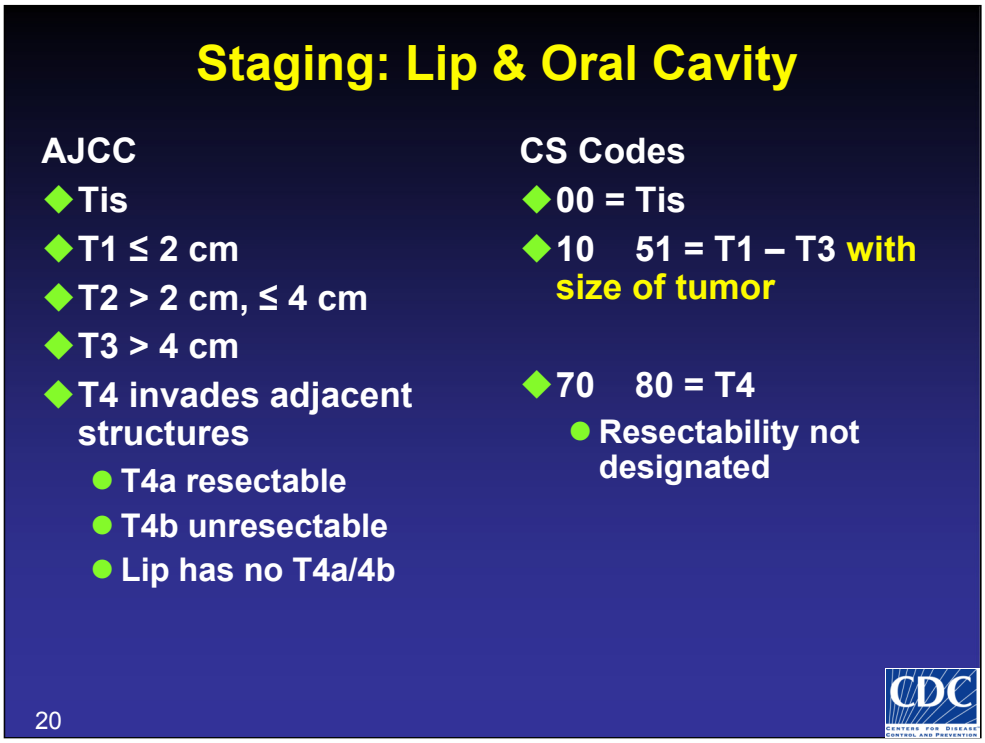
Let's talk about the buccal mucosa; that is the inside lining of the cheeks and the lining of the lips. It is a mucosal surface. The vestibule is the area between the alveolar ridge and the lips. The alveoli or sockets hold the teeth. The alveolar sulcus is the groove or depression that surrounds the alveolar ridge anteriorly, and the retromolar trigone is the area at the angle of the jaw behind the wisdom teeth.

Minor salivary glands can be found in the cheek and buccal mucosa. ICD-O-3 directs us to code a minor salivary gland tumor to the site in which it is found, rather than to the salivary gland, NOS.

The Stensen's or parotid duct is where the parotid gland empties saliva into the mouth.

Fordyce's granules (the yellowish patch under mucosa) are intraoral sebaceous glands. You may not be able to see the color difference on the slides, but you may be able to see it within your own mouth.

This is the last site of the oral cavity.



We'll talk about regional lymph nodes toward the end of this presentation. The "T" definition in this chapter is primarily related to the size of the tumor until we get to T4. A variety of organs are considered adjacent, through muscle, through bone, even skin of the face. The entire head and neck section of the AJCC manual has a new concept in the sixth edition. Not only do we pay attention to the organs documented, we must also pay attention to the decision of the surgeon whether the tumor can be resected. If the tumor invades the organs listed in T4a, BUT the surgeon documents that the tumor is unresectable, the T should actually be advanced to T4b.

In Collaborative Staging, we document the involvement of specific organs within extension codes 10–51, but the computer algorithm will also need the tumor size to determine T1, T2, or T3. Codes 70–80 are the organs that fall into the T4 category. There will not be the choice of whether the tumor is resectable because T4a and T4b are not broken out.

Distribution by Site: Squamous Cell Carcinoma

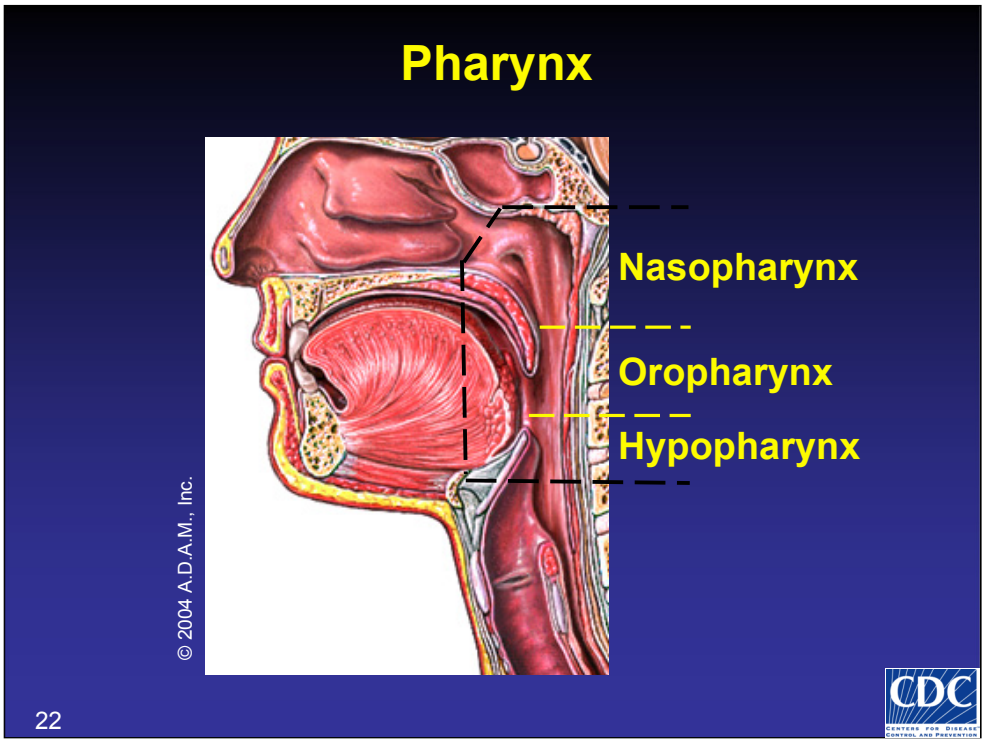
General Location	Specific Location	Incidence
Tongue	Lateral surface Ventral surface	26%
Oral Pharynx	Soft palate Tonsillar pillars	23%
Lip	Vermilion surface	20%
Floor of Mouth	Floor of mouth	17%
Gingiva	Gingiva	9%
Buccal Mucosa	Buccal mucosa	3%
Hard Palate	Hard palate	2%

21 www.usc.edu/hsc/dental/opath/Chapters/Chapter13_Text.html

Squamous cell carcinoma can develop in nearly any site among the head and neck organs. This table shows the frequency distribution of primary sites for squamous cell carcinomas only. Other histologies would have a different distribution.

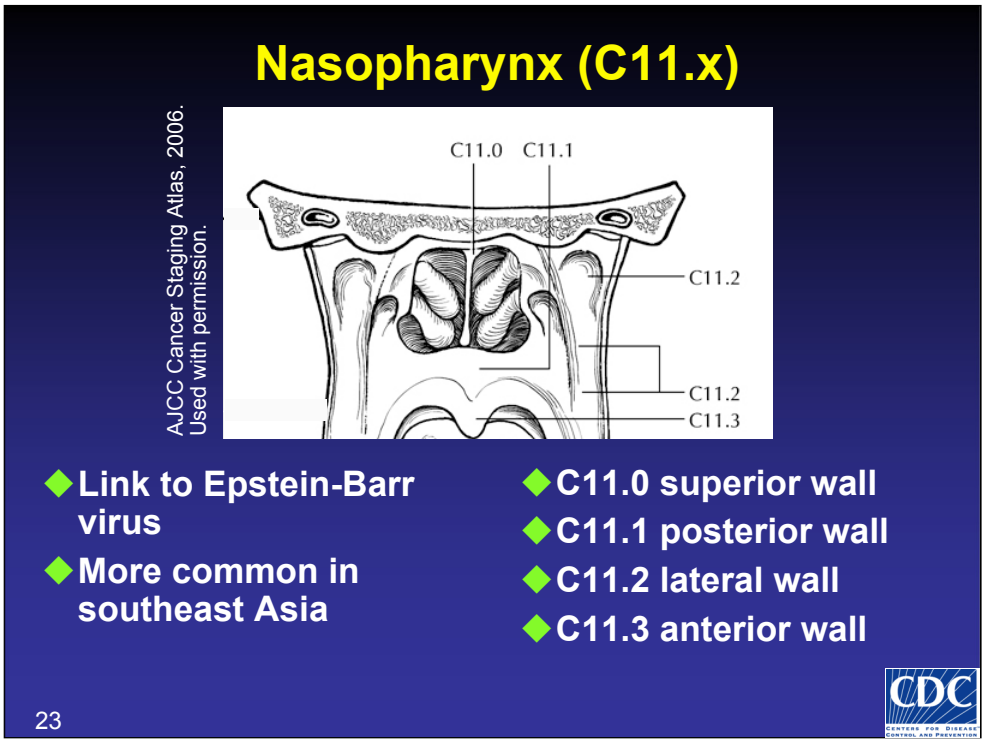
Note that the tongue, oral pharynx, and floor of mouth account for two-thirds of all oral cancers. Buccal mucosa and hard palate cancers are comparatively rare.

This table can also serve to remind us how often we might see these sites within our registry.



Next, we move into the pharynx. This is a very confusing part of the anatomy. The pharynx is a soft, collapsible tube more commonly known as the “throat.” It starts at the back of the nose and goes down to the level of the larynx. It’s the common passageway of both the respiratory and digestive systems and is very busy for a hollow tube and the parts that surround it.

There are three subdivisions: naso-, oro-, and hypopharynx, and we’re going to look at each one separately.



Let's start at the top of the pharynx. The illustration from the *AJCC Cancer Staging Atlas* shows the walls of the nasopharynx looking from the back of the head into the nasal cavity. The nasopharynx starts at the posterior opening of the nasal cavity and goes to the superior side of the soft palate (but does not include the uvula).

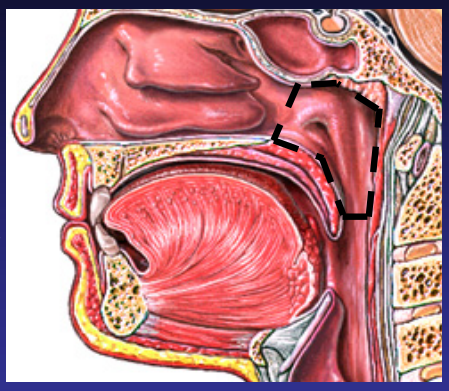
Nasopharyngeal carcinoma is unique among the head and neck cancers because it does not have the connection between alcohol and tobacco that is found in the other head and neck sites. There is a bimodal age occurrence: young adulthood and between 50 – 70 years. Most patients exhibit the Epstein Barr virus, which is a unique risk factor for nasopharynx (1).

Patients from the Far East, especially southern China, could have a genetic susceptibility because even when they emigrate to other countries, their children are still at increased risk. The diet of those from the Far East might also play a part because they have increased intake of salted fish.

Reference:

1. Paulino AC, Grupp SA (2006). Nasopharyngeal Cancer. *eMedicine from WebMD*. Retrieved October 3, 2007 from Web site: http://www.emedicine.com/ped/topic1553.htm.

Nasopharynx (C11.x)



- Nonkeratinizing SCC 50+%
- Keratinizing SCC 30%
- Lymphoepithelioma 25% (a variant of SCC)

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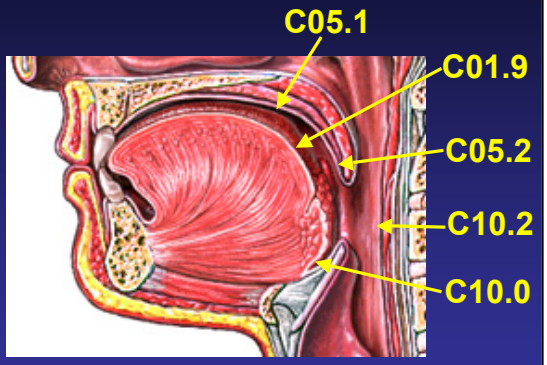
Here's a side view of the nasopharynx. The function of the nasopharynx is to conduct air breathed in through the nose down to the rest of the pharynx and to channel mucus produced by the membranes within the nose down the throat.

Parts of Oropharynx (C01.9, C05.1, C05.2, C09.x, C10.x)

- C01.9 Base of tongue
- C05.1 Soft palate
- C05.2 Uvula
- C09.x Tonsils (not shown)
- C10.0 Vallecula
- C10.2 Oropharynx wall (walls of throat)
- NOT C10.1 Anterior surface epiglottis



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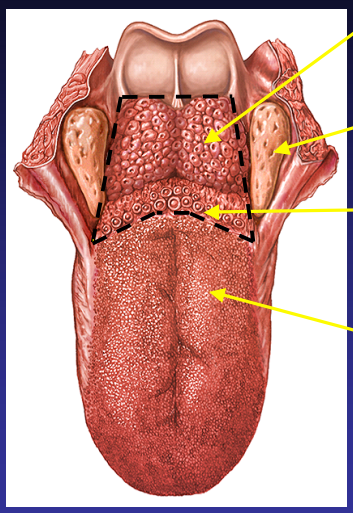
The oropharynx includes a number of primary sites. The tonsils are the most common cancer site in this area, which includes the Waldeyer's ring of lingual, pharyngeal, and nasopharyngeal tonsils.

What's a vallecula? (Latin for "little room.") It's the crease, furrow, pocket, or depression just behind the root of the tongue between the folds in the throat. You have valleculae other places in your body (e.g., in the brain, they separate the hemispheres of the cerebellum), but we are usually referring to the oropharynx area when we use the term vallecula.

Note that the anterior or lingual surface of the epiglottis is NOT part of the oropharynx; it is part of the larynx.

Base of Tongue (C01.9)

- Posterior 1/3
- Usually larger when diagnosed
- 60–80% positive neck LNs (40% bilateral)



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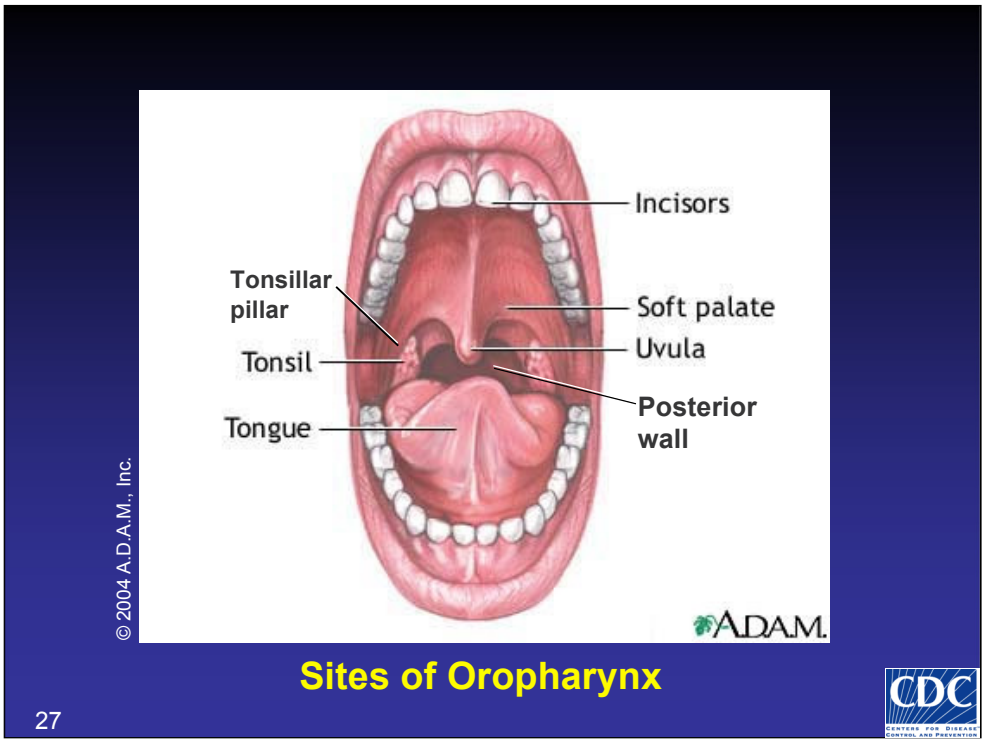
The base of tongue is the posterior third of the tongue, the part that is anchored in the back of the mouth. It is sometimes called the root of the tongue.

Base of tongue tumors are commonly diagnosed at a larger size because there aren't really symptoms. Fullness when swallowing is the most common symptom. That's usually not enough to bring a patient in to see the doctor.

A high percentage of patients have positive lymph nodes when diagnosed because of being asymptomatic for so long, as well as the proximity of neck nodes to this site.

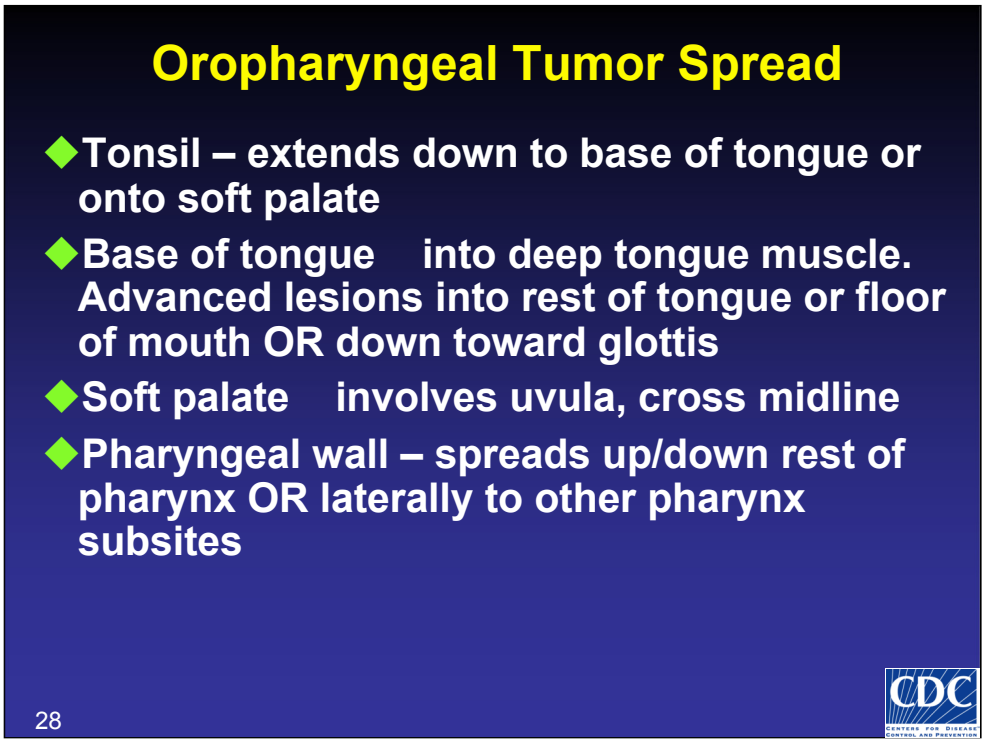


Oropharyngeal cancer has a high propensity to spread to the cervical lymph nodes.

The job of the soft palate is to cover the nasopharyngeal opening so food doesn't go up your nose. However, if you laugh and try to eat at the same time, it gets confused between letting air go down and food go up, so you might have milk coming out your nose.

On the tonsillar pillar there is a recess or depression called the tonsillar fossa. The tonsil itself sits in the tonsillar fossa. The tonsil is primarily lymphoid tissue.

There really aren't any distinct structures on the posterior wall of the oropharynx, but that's what you see when you look at the back of your throat in a mirror.



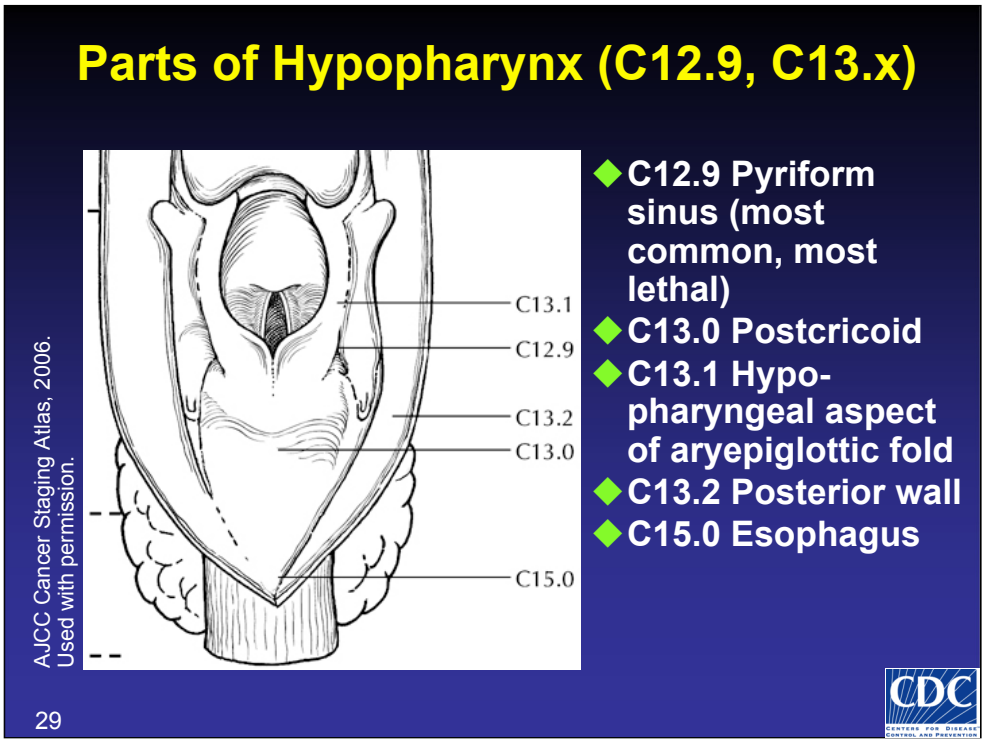
The patterns of spread differ depending on where the tumor started.

•Tonsil tumors extend down to base of tongue or onto soft palate

•Base of tongue tumors extend into deep tongue muscle. Advanced lesions into the rest of the tongue or floor of mouth OR down toward glottis

•Soft palate tumors involve uvula, cross midline

•Pharyngeal wall tumors spread up or down the rest of pharynx OR laterally to other pharynx subsites

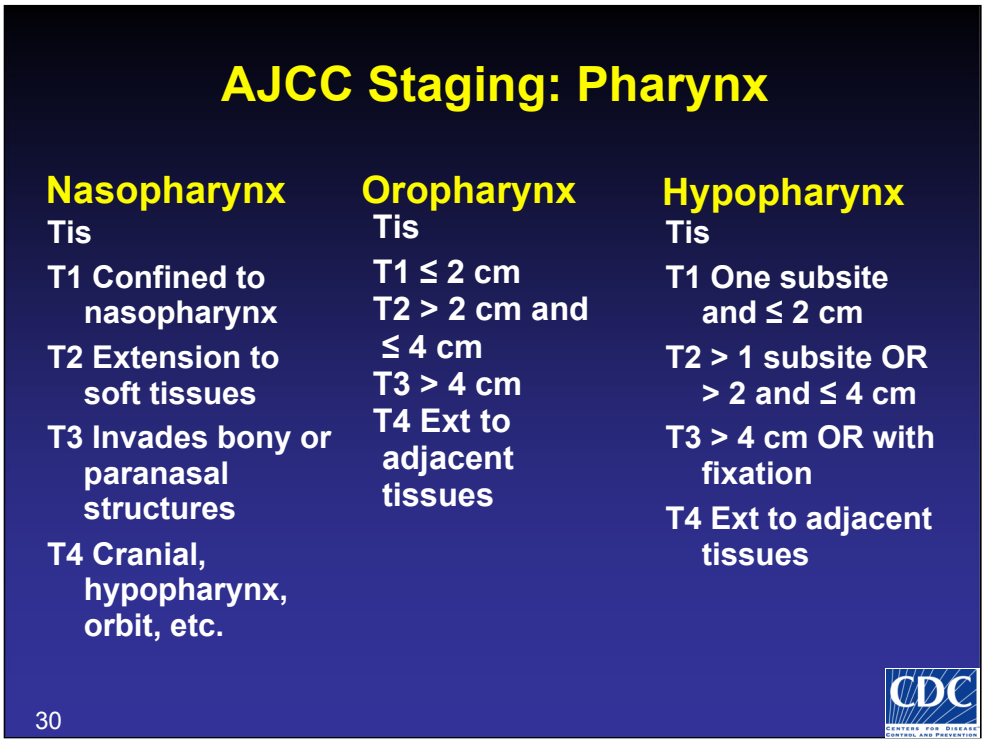


The esophagus code was left in as a reference so you could see how we're progressing down the throat.

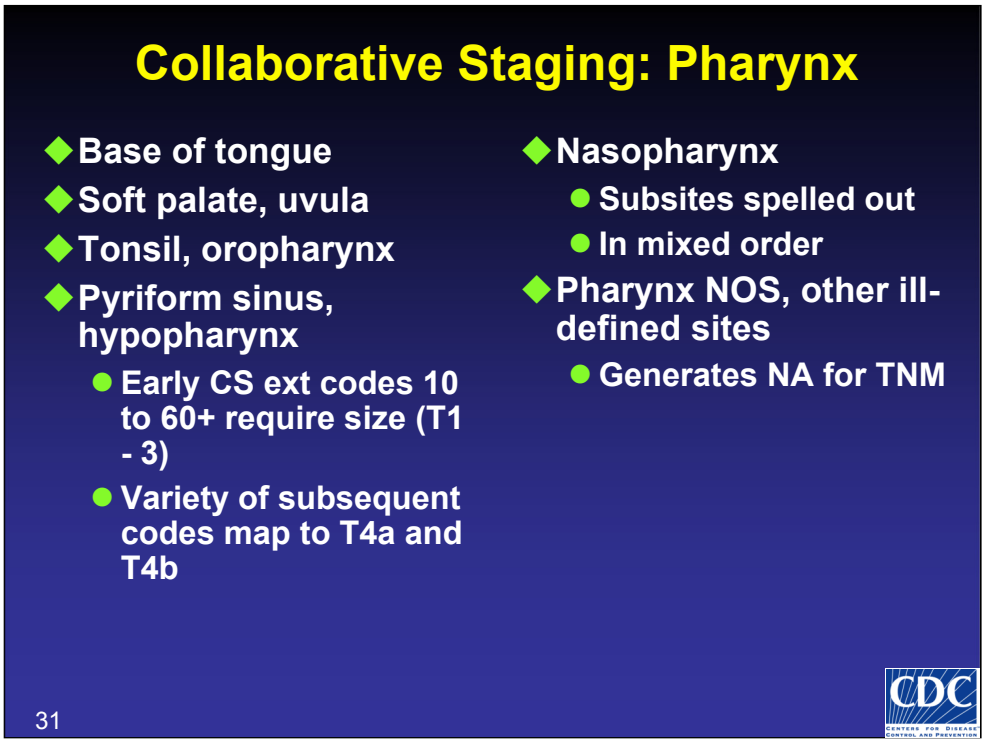
The post cricoid region is behind the cricoid cartilage of the thyroid. We'll look at that later. C13.1 refers to the hypopharyngeal aspect of the aryepiglottic fold; that is, the part of the larynx that is facing the hypopharynx.

Cancers in the hypopharynx are among the most lethal in the head and neck. They could be related to esophageal reflux or Plummer-Vinson Syndrome (an iron deficiency syndrome).

Fifty to 75% of hypopharyngeal tumors have positive lymph nodes at diagnosis.

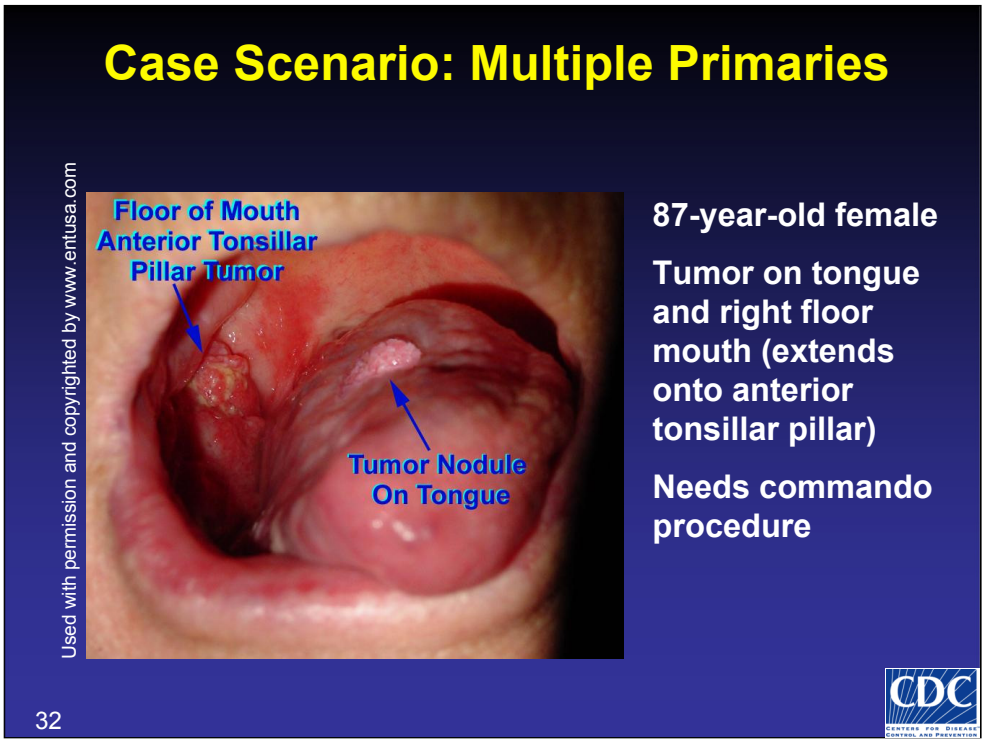


Each subsite within the pharynx chapter is classified differently when it comes to TNM staging. Nasopharynx and hypopharynx are based on extension of tumor. Oropharynx and hypopharynx are based on size. All subsites subdivide T4 as T4a (resectable) versus T4b (unresectable).

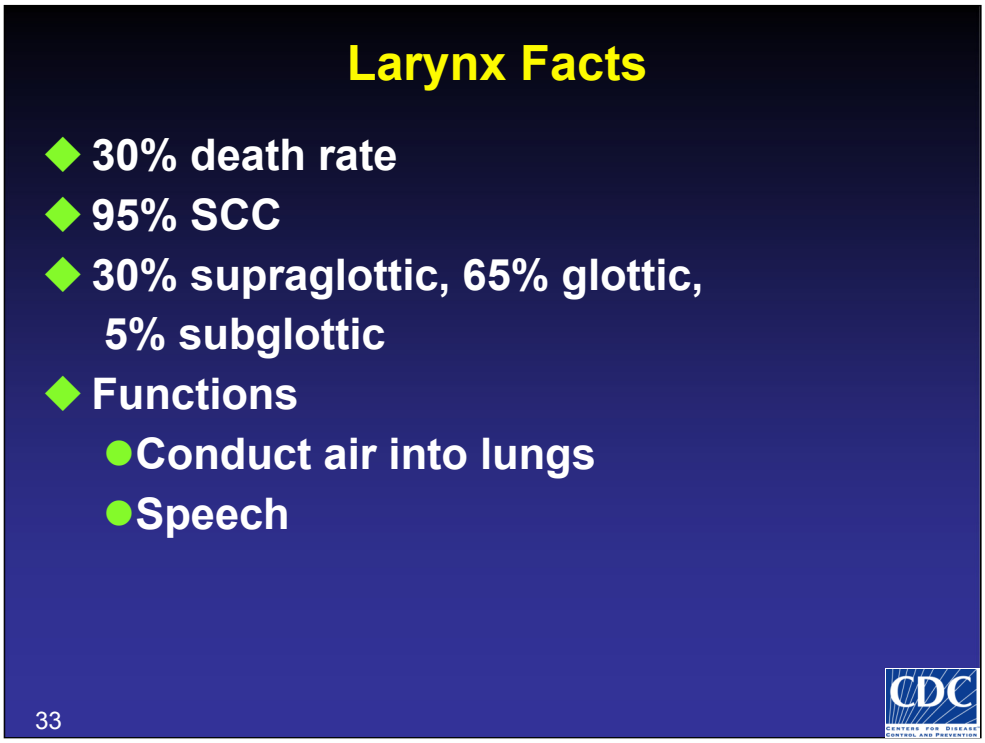


The sites on the left of the slide allow us to code extension of the tumor to other organs within the mouth, but also require size of the tumor to generate a derived "T" category. After approximately code 60 in each of these chapters, there are organs listed that would generate the derived "T4a" or "T4b" category. Be careful when reading these because the T4a and T4b might be intermingled.

What if a physician declares a tumor unresectable (T4b), but the description from the physical examination or scope does not include organs that would lead to a T4b category? The AJCC chapters don't have T4b, NOS possibility. So we follow this axiom: "when in doubt, select the lower or less advanced category/code."



This would be a relatively common occurrence in the mouth: two primaries diagnosed at the same time. The patient has a tumor on the ventral surface of the tongue (patient has rolled her tongue). This patient would need total excision of the tongue because the tumor appears to cross the midline, and at least a tonsillectomy. We would then add some kind of neck resection or neck radiation therapy.

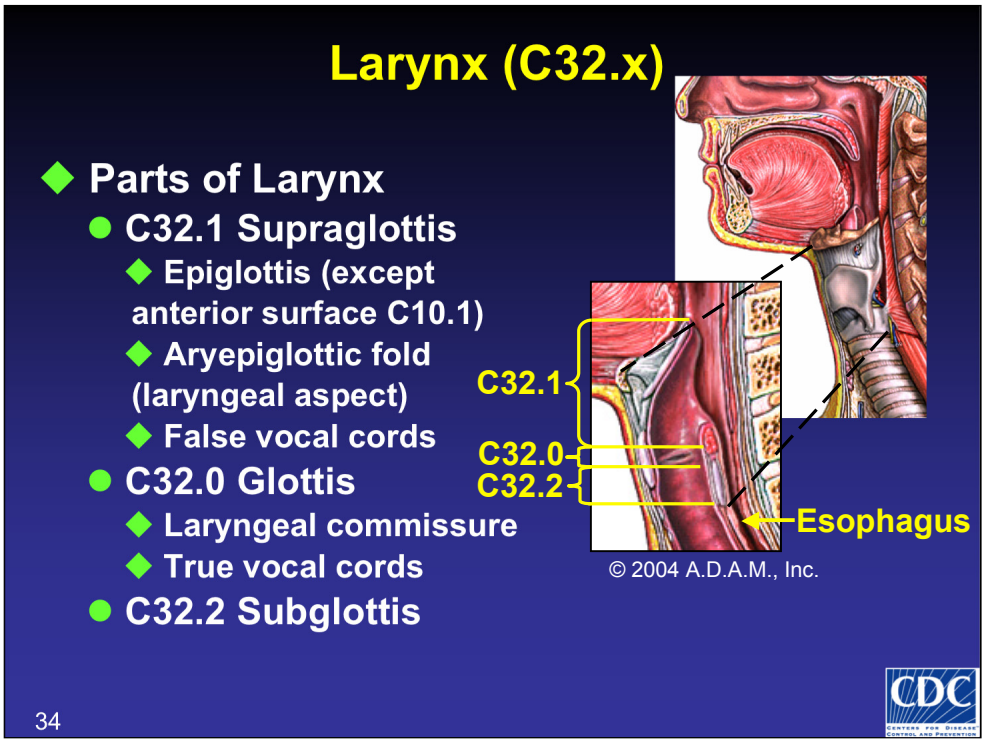


Larynx is the most common tumor among the head and neck sites, according to American Cancer Society statistics. The larynx not only serves as an air passage, it aids in phonation (creating sounds), and also acts as a sphincter to guard the airway.

Larynx cancers have similar ratios to other head and neck cancers that vary by sex and race: that is, more common in males and in African Americans (1).

Reference:

1. Larynx Cancer: Who is at risk for larynx cancer? *MedicineNet.* Retrieved October 3, 2007, available at: http://www.medicinenet.com/larynx_cancer/page3.htm#3whatcauses



Let's all put our finger in the sternal notch or near the Adam's Apple. Now hum Happy Birthday. Only a thin membrane and the skin of your neck separate your finger from the glottis (voice box).

This slide shows how we code the individual primary sites into the subsections of the larynx.

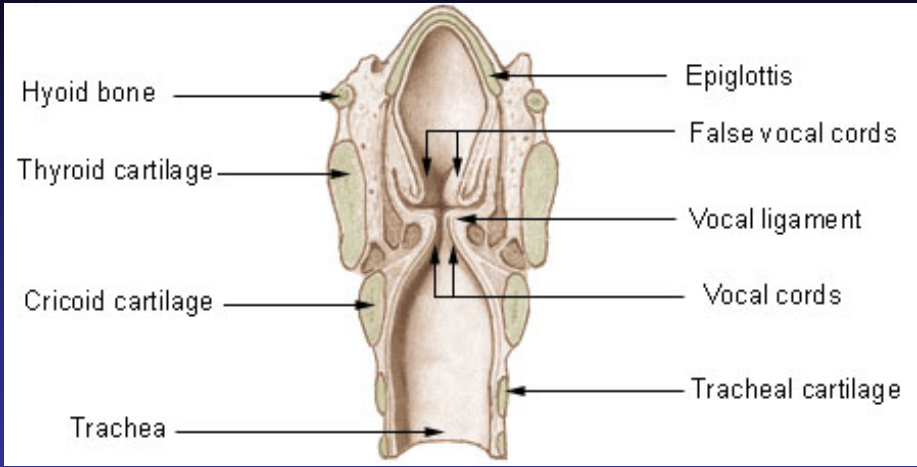
•The epiglottis is the flap at the top of the larynx.

•The vocal cords and commissure are part of a very narrow area in the center of the larynx.

•The subglottis is just like it sounds: under (sub) the vocal cords (glottis). It is the area between the vocal cords and the beginning of the trachea. Also, as we've noted, it's rare to have cancer there.

The esophagus is directly behind the larynx.

Parts of Larynx (C32.x)



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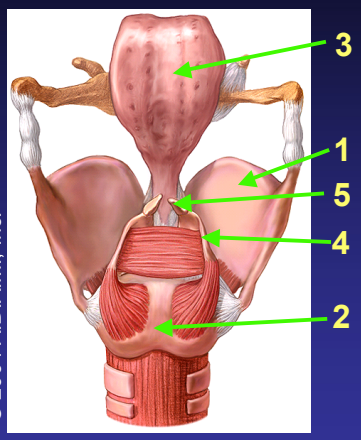
The larynx is protected within a cartilaginous skeleton with extrinsic and intrinsic muscles and lined with mucosa. Intrinsic muscles are totally within the larynx, and extrinsic muscles are within and outside the larynx.

Laryngeal Cartilages (C32.3)

- Single
  - Thyroid cartilage (a.k.a. Adam's apple)
  - Cricoid cartilage
  - Epiglottis
- Paired
  - Arytenoid cartilage
  - Corniculate cartilage
  - Cuneiform cartilage (not shown)



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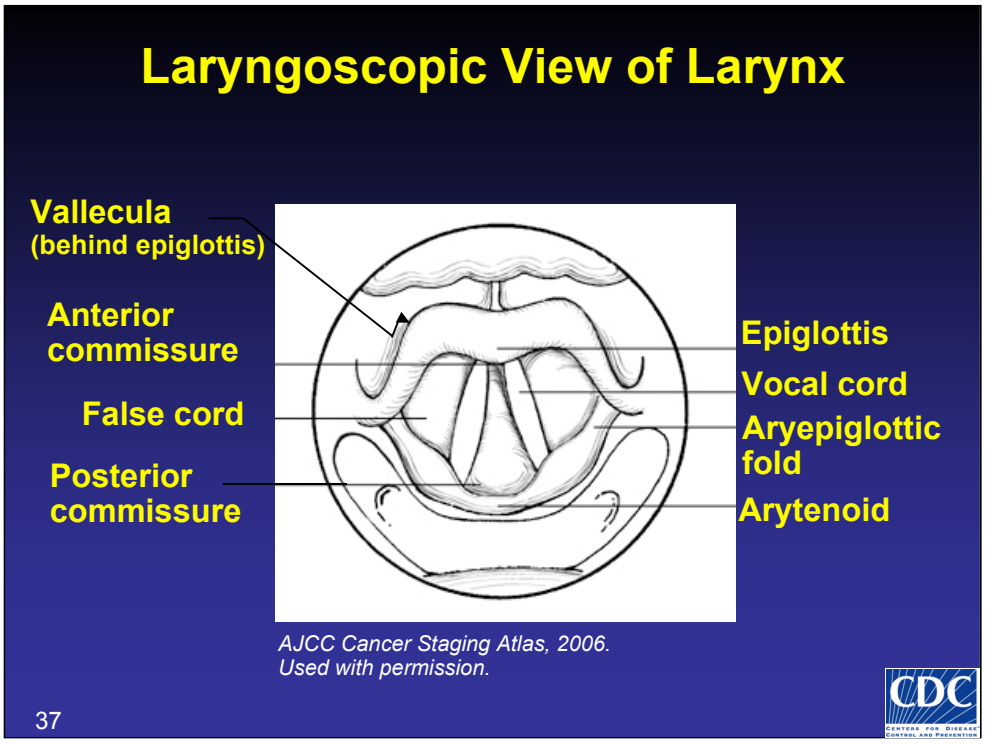
Don't be fooled by the thyroid cartilage and think it's C73.9. Most of these cartilages are coded C32.3. The thyroid cartilage is the largest and forms the Adam's apple, more prominent in men. The cricoid cartilages are shaped like a signet ring. The epiglottis is part of the supraglottis and coded with it. The epiglottis is shaped like a leaf.

The arytenoids are shaped like pyramids and are a point of attachment for the vocal cords themselves to the cartilage skeleton. The corniculate and cuneiform are very small cartilages.

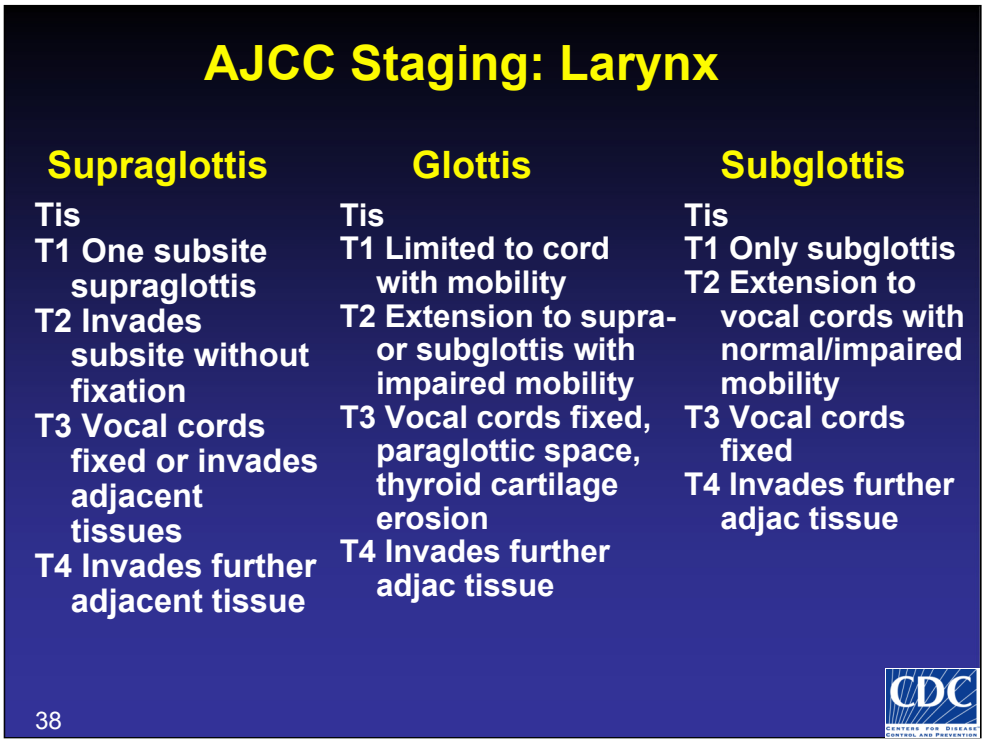


This is what the ENT doctor sees when performing a laryngoscopy. The front of the body is toward the top of the picture and we're looking down into the trachea.

The vallecula, the pocket or depression, is between the base of the tongue and the larynx. The false cords are also known as the ventricular folds.

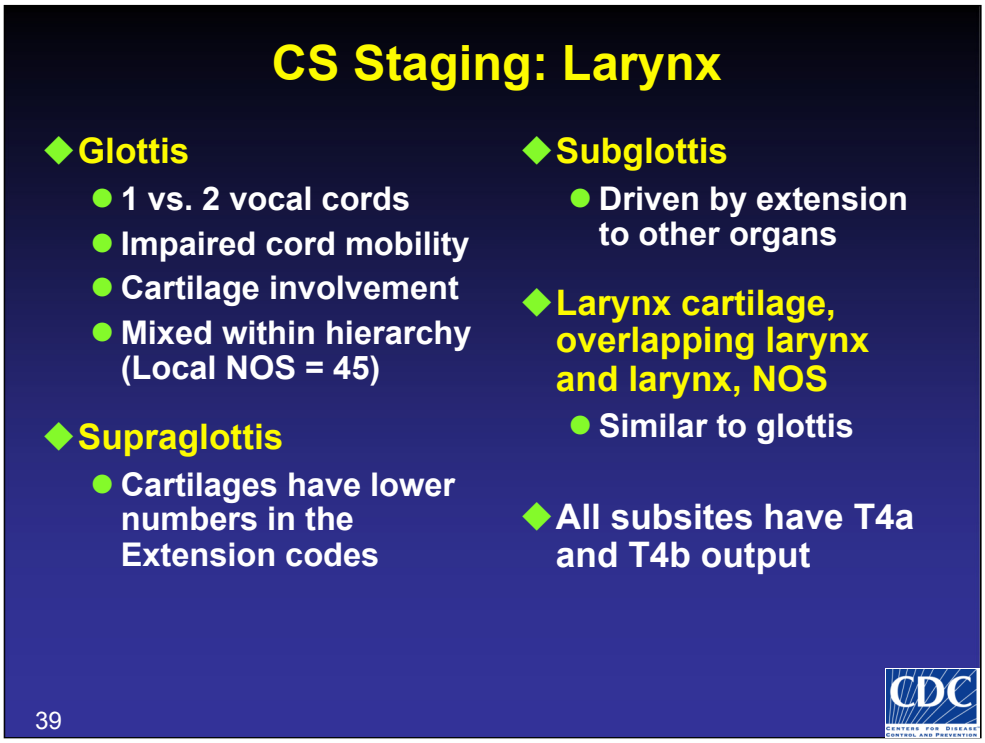
The epiglottis is open (flipped up) on the picture. The epiglottis prevents food from getting into the larynx when we eat. The aryepiglottic fold is a membrane that connects the arytenoid cartilage to the epiglottis. The false cords lie above and lateral to the true vocal cords and are not supposed to be used during normal phonation.

The commissure is the point where the vocal cords join together (like the corner of your mouth). The true vocal cords are two elastic tissue bands that open for the entryway into the trachea. They are open when you're breathing and closed when you're talking.



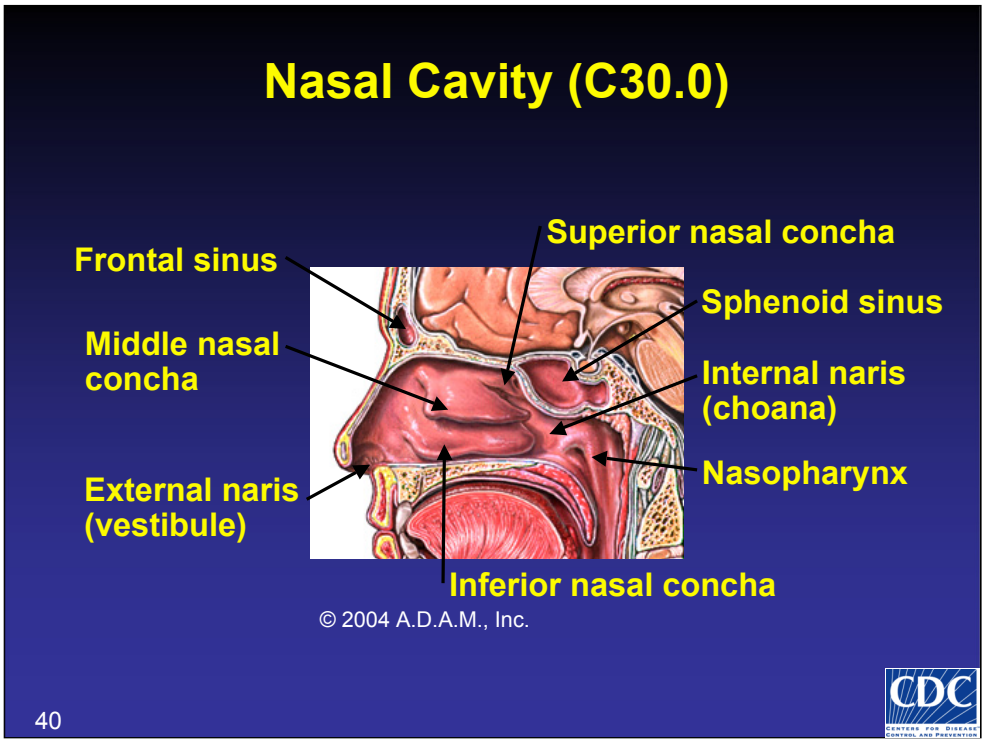
There are three different schemes in AJCC; each is based on a specific primary site code.

Glottis includes subdivisions of T1a and T1b. T4 includes subcategories of T4a and T4b. (We'll look at regional nodes and distant metastasis later.)



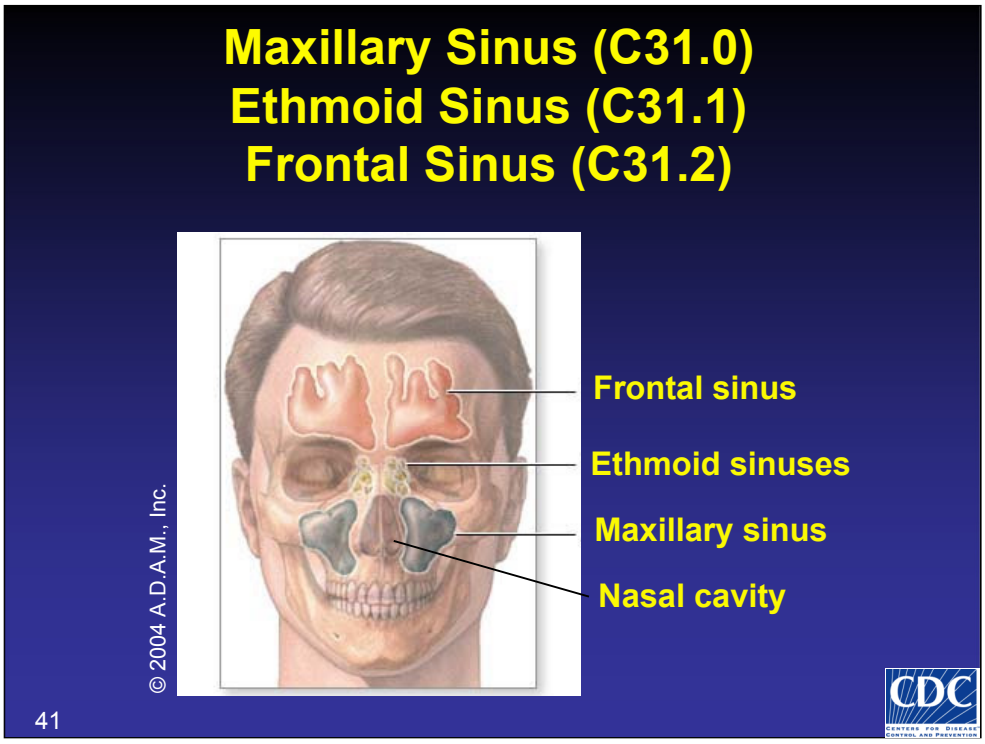
In Collaborative Staging, each of the subsites within the larynx has its own code structure, and there is an additional schema for the remaining nonspecific codes. Make sure you are coding from the correct schema because there are different code choices, especially for CS Extension. This slide shows some items you should watch for to choose the correct code.

The numerical order of extension codes leads to jumbled “T” categories (not in number order). For example, the Local NOS (T1NOS) code is 45 in glottis, and we’ve already passed up some codes that derive T1, T2, or T3.



The nasal cavity is an area of the face that includes the protruding nose along with its nostrils and the structures inside the nose. Cancer is rare; rhinorrhea and epistaxis aer much more common. The nasal cavity is lined with mucous membrane, which is where most cancers originate. The olfactory membrane, or epithelium, is a layer of cells on the roof of the nasal cavity. It is pigmented, and the pigmentation somehow works with the sense of smell. Albino animals lack a sense of smell.

Symptoms of nasal cavity cancer include pain in the teeth or eyes, swelling, sinus infection or bleeding that doesn't get better, and lumps or sores in the nose.



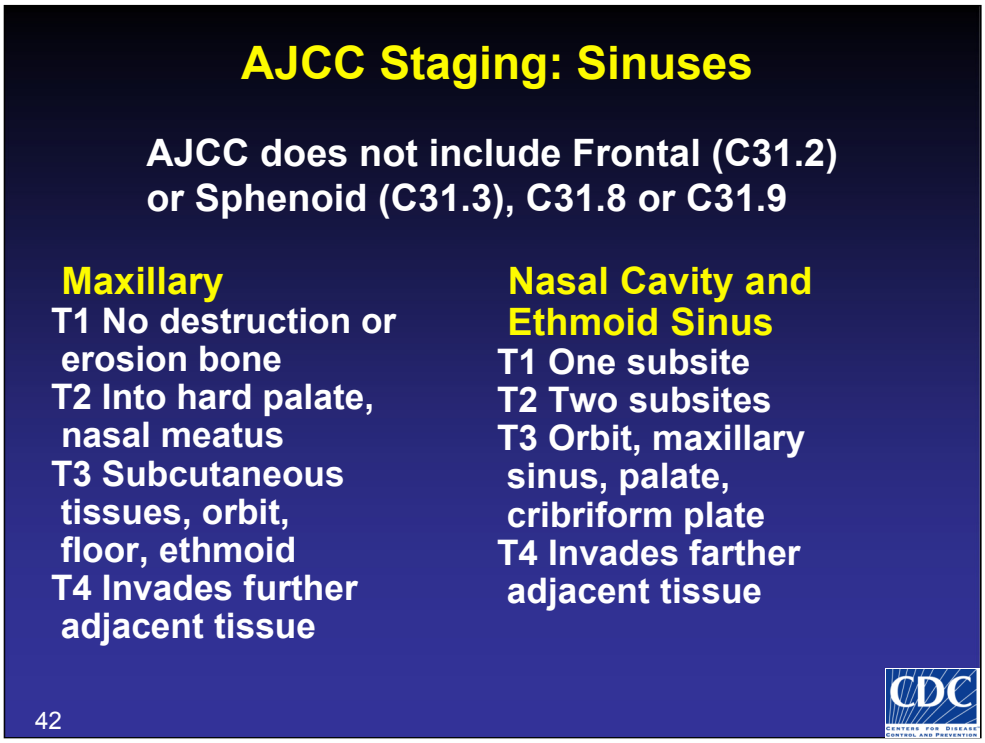
The paranasal sinuses are air spaces within bone and are lined with squamous epithelium. If we didn't have them, our head would be too heavy for our neck. They also allow the air to get to a temperature the rest of our body can use.

The maxillary sinus is the largest paranasal sinus. It is intimately related to the upper teeth, tear ducts, and the floor of the orbital cavity. The maxillary sinus must pump mucous uphill to reach the sinus opening that is at the top. The ostium (opening) for the maxillary sinus is actually the size of the head of a pin.

The ethmoid sinuses drain into the superior meatus and middle meatus of the nasal cavity.

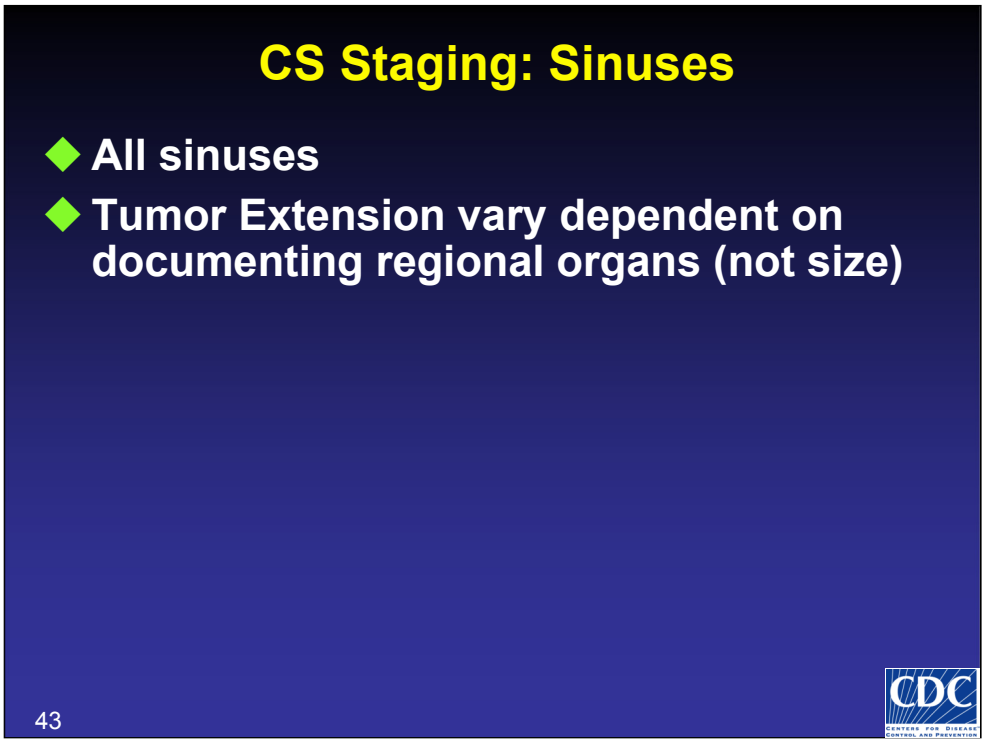
The maxillary sinus comprises 55% of these rare tumors, 35% are in the nasal cavity, and 9% are in the ethmoid sinus. (One percent are in the other sinuses, including frontal and sphenoid; because they are so rare, they are not included in AJCC Staging.)

Eighty percent of sinus tumors are squamous cell cancers, although you can also have adenocarcinomas, lymphomas, and melanomas in the sinuses. Lymphomas are divided into T-cell category (more common in Asia and South America) versus B-cell category (more common in Western studies according to the International Agency for Research on Cancer). Cancer in these sites is associated with exposures to chemicals and metals per the Physicians Data Query from the National Cancer Institute.

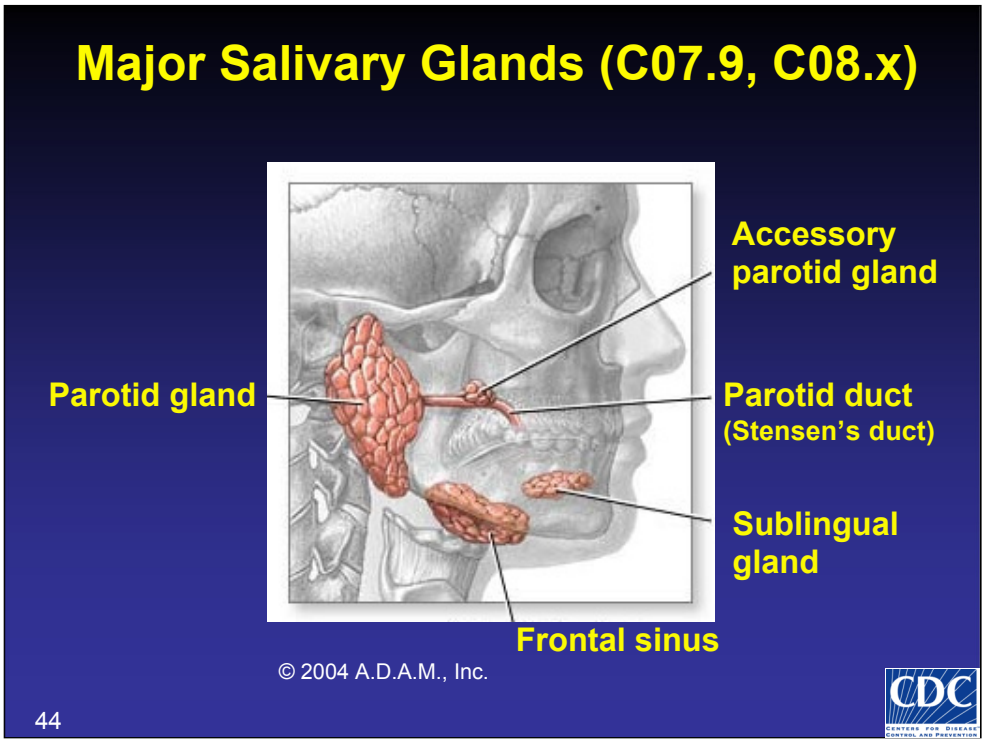


Staging for nasal cavity and ethmoid sinus was a new site in the sixth edition of the *AJCC Cancer Staging Manual*. This is probably a site you will rarely see because the incidence is <1 per 100,000 people.

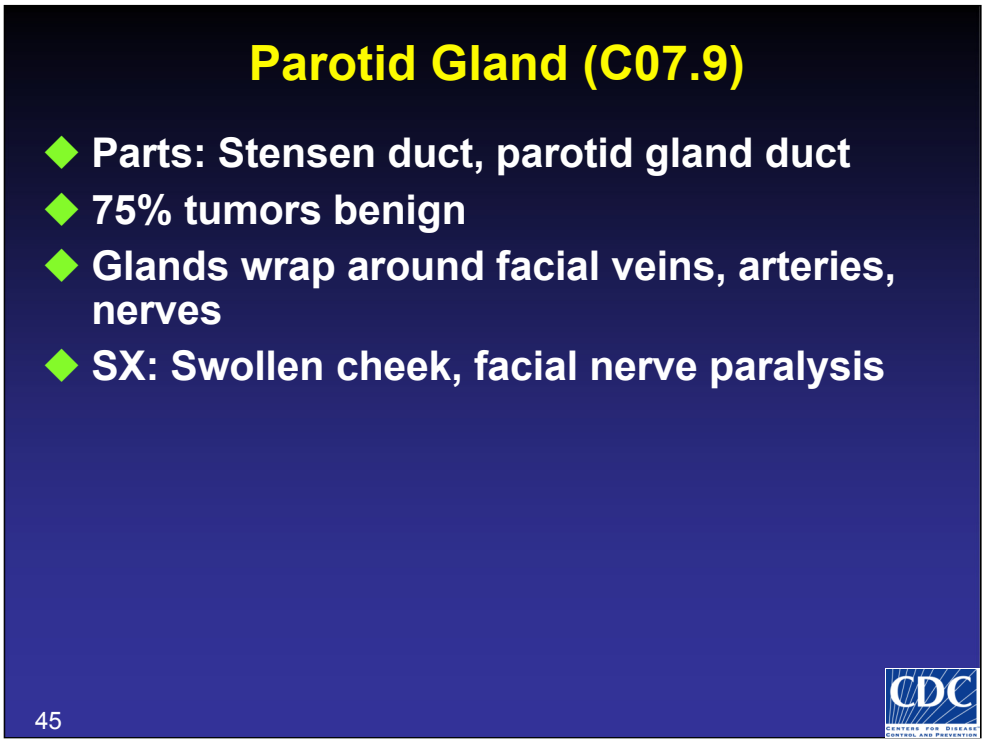
T4 includes extension to the skin of the cheek, pterygoid plates, frontal/sphenoid sinuses, brain, and cranial nerves.



CS information can be documented about all sinuses. The accessory sinuses follow a similar pattern of documentation, but there is no AJCC staging generated by the CS computer algorithm.



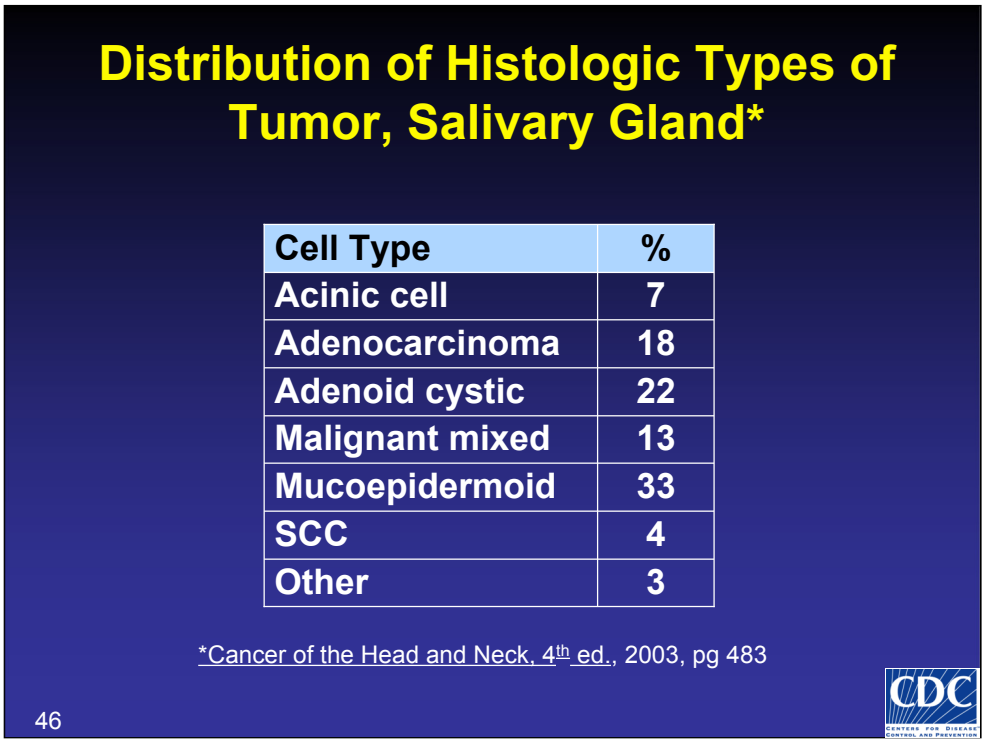
Included in the head and neck area are some glands that secrete saliva, the lubricating fluid for the mouth and throat. The glands release the saliva through ducts found in the cheeks and floor of the mouth. The three major salivary glands are the pairs of sublingual, submaxillary, and parotid glands.



The parotid gland is the largest of the salivary glands. We've already seen the Stensen and parotid gland ducts and where they're located within the cheek earlier.

The good news about parotid gland tumors is that the majority of them are benign adenomas, according to the National Cancer Institute.

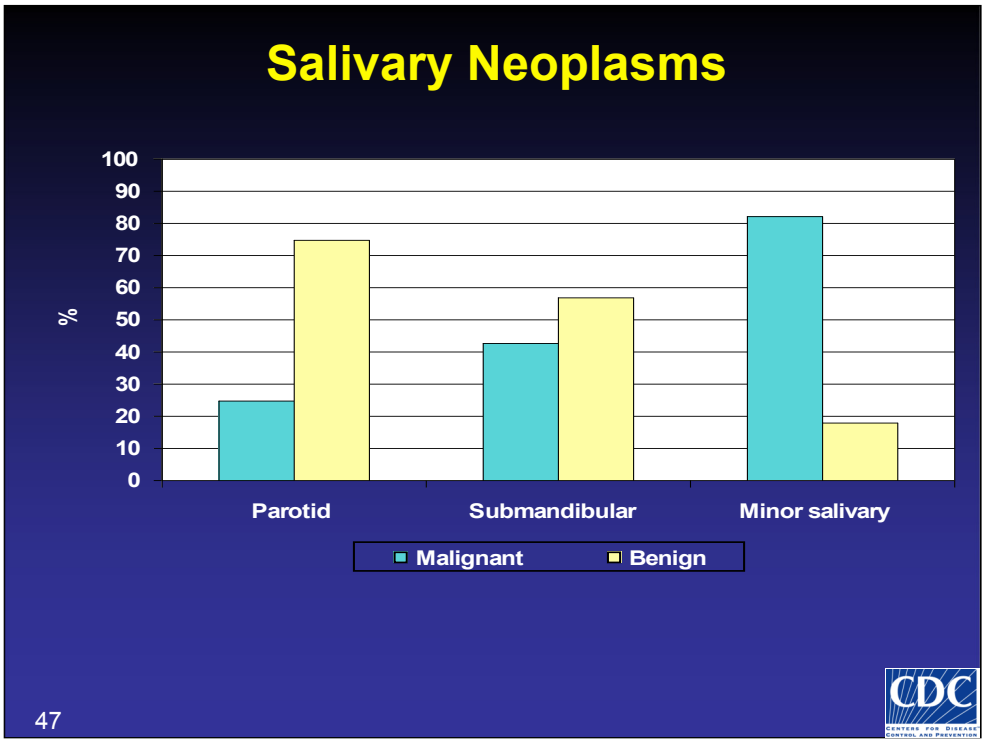
The complicated part of surgery on these glands is avoiding damaging the facial nerve that runs through them, causing facial paralysis.



About 75–80% of parotid tumors in a community hospital setting will be benign, per the National Cancer Institute. This series was from Memorial Sloan Kettering Hospital in New York City (as published in the book cited), which could see more unusual things that might explain their higher percentage of malignant tumors. Even so, the majority of these gland tumors are benign. When the tumors are malignant, there is a variety of histologies, with mucoepidermoid being the most frequently seen.

Reference:

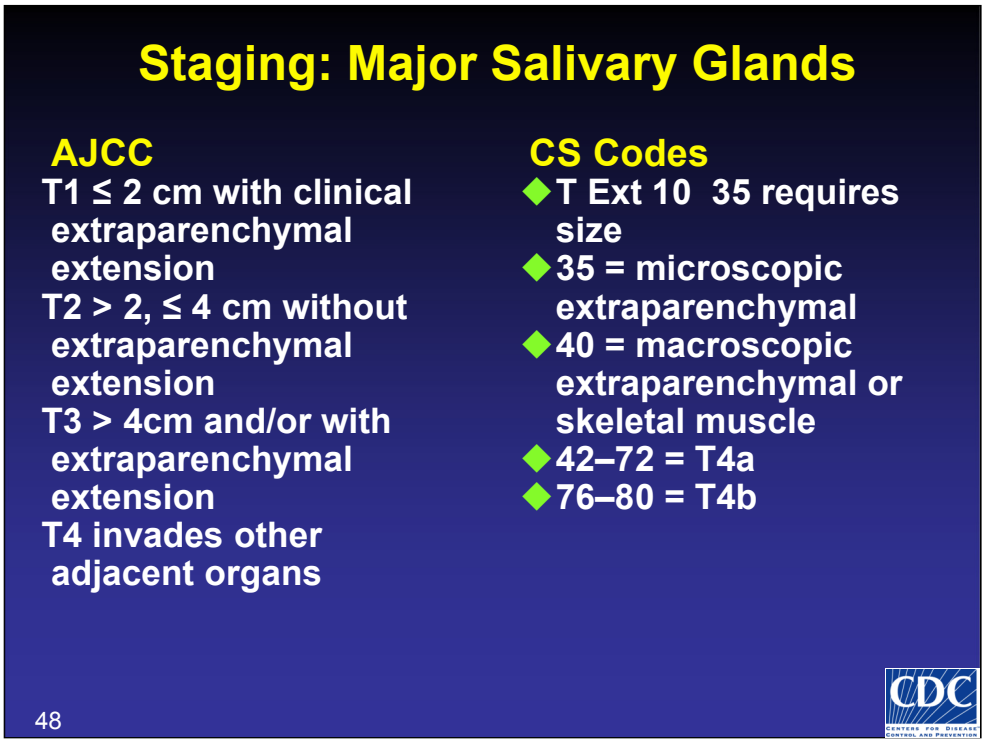
1. Myers EN, Smith MR, Myers J, Hanna E. *Cancer of the Head and Neck*. 4th edition, New York, New York, Saunders, 2003. ISBN-10: 0721694802; ISBN-13: 978-0721694801



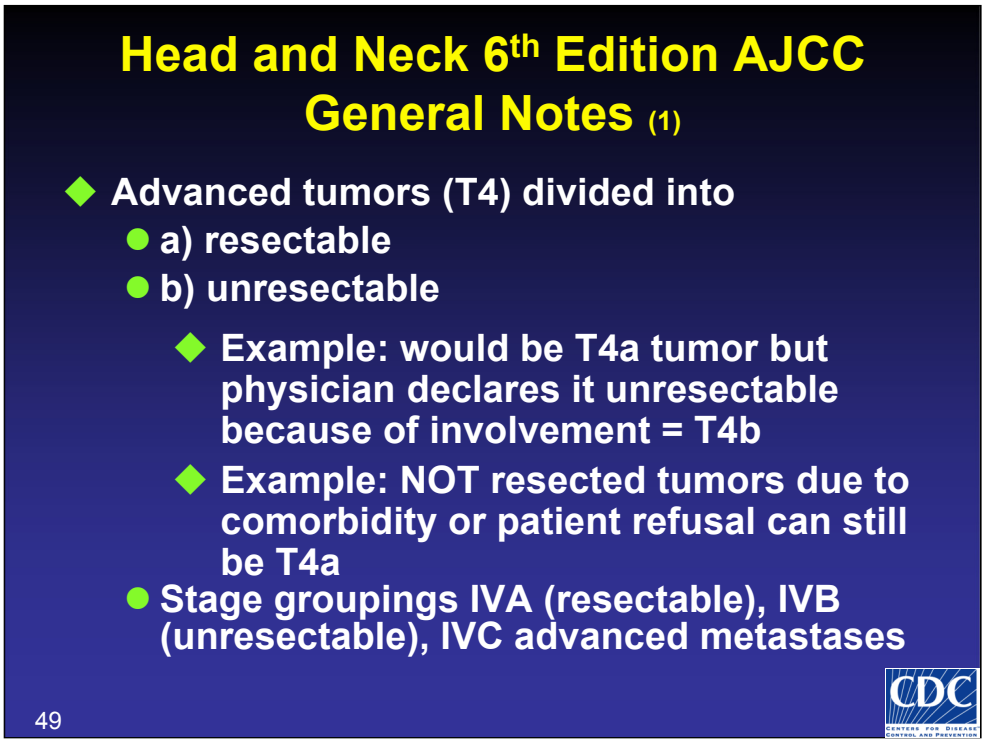
As you can see, the chances of a malignant tumor being found may depend on which salivary gland you're talking about (1).

Reference:

1. Myers EN, Smith MR, Myers J, Hanna E. *Cancer of the Head and Neck*. 4th edition, New York, New York, Saunders, 2003. ISBN-10: 0721694802; ISBN-13: 978-0721694801

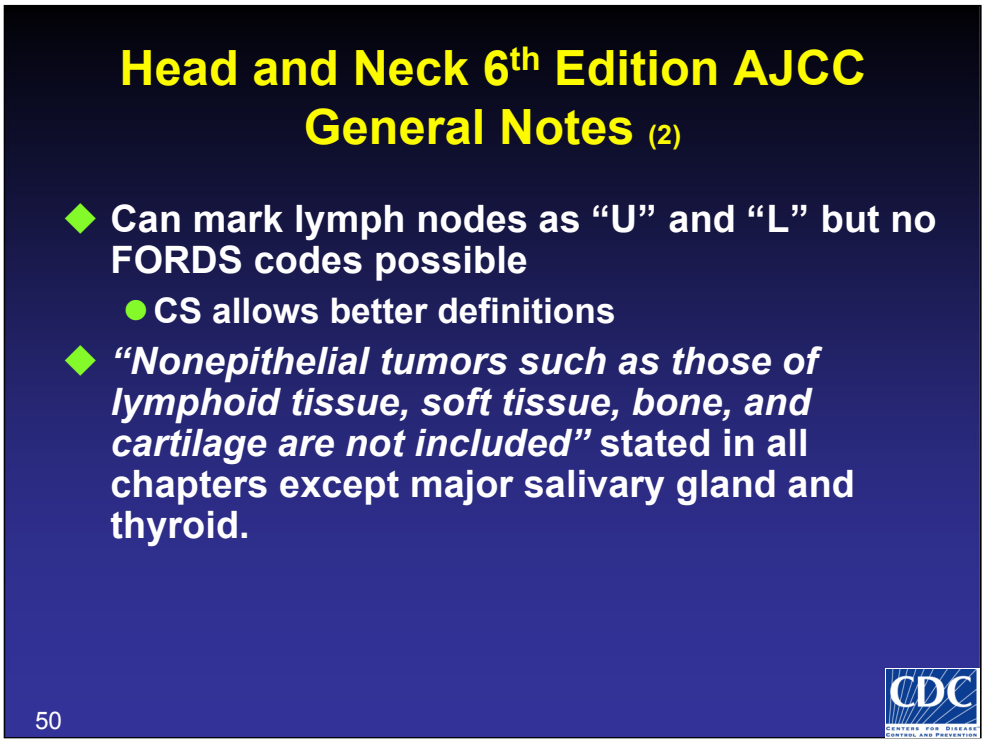


Extraparenchymal extension is clinical or macroscopic evidence when cases are staged in the AJCC system. Microscopic evidence alone does not influence the AJCC stage, but it can be documented in the Collaborative Stage.



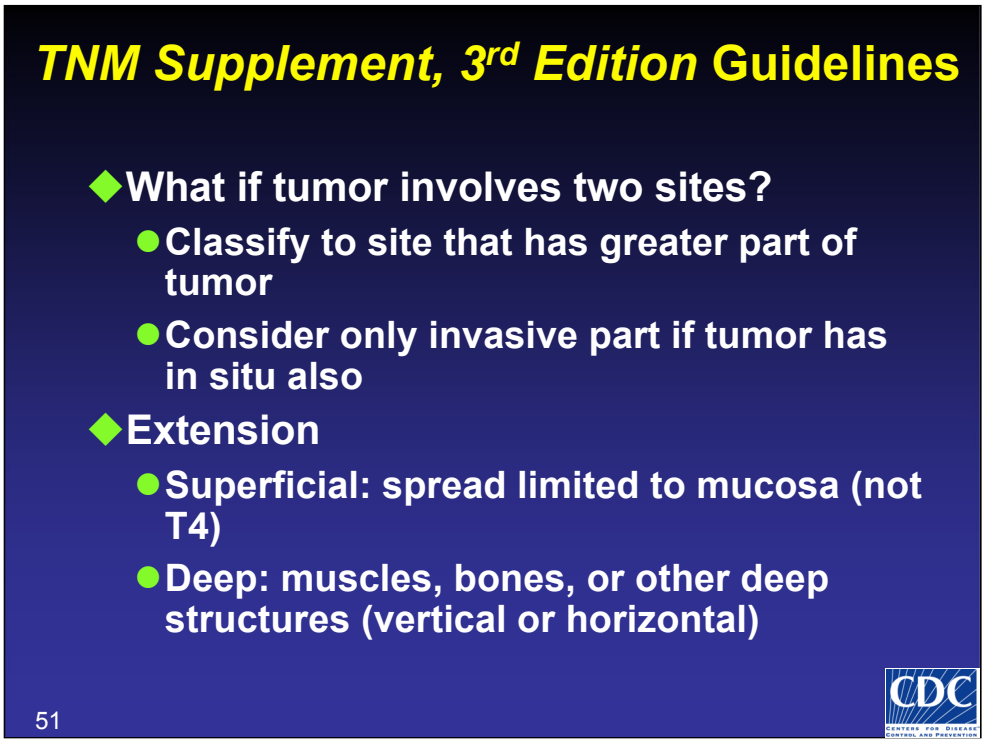
Unresectable tumors are separated from high-stage resectable tumors to show the prognostic difference in survival calculations.

Pay attention to the cell types in whatever TNM chapter you are using. (Collaborative stage does this behind the scenes.)



Whether the dissection is upper versus lower neck lymph nodes is not possible to document, although AJCC requests that it should be documented. However, that information will be gathered in the Collaborative Stage so it will still be available.

The CS statement about "nonepithelial tumors" is documented in all chapters except major salivary glands and thyroid cancers. Tumors found in those sites (e.g., bone for example) would go to another chapter, even if the bone is from a head and neck chapter.



An example of the first bullet would be a tumor on the hard and soft palate. If the ENT physician states the majority of the tumor is on the hard palate, that's the way we should code it and stage it.

An example of the second bullet: tumor within the tonsil and some in situ spread found in soft palate. We only code it as tonsillar tumor.

When we talk about extension of the tumor, it can be superficial versus deep. This supplement offers us some definitions of those two choices.

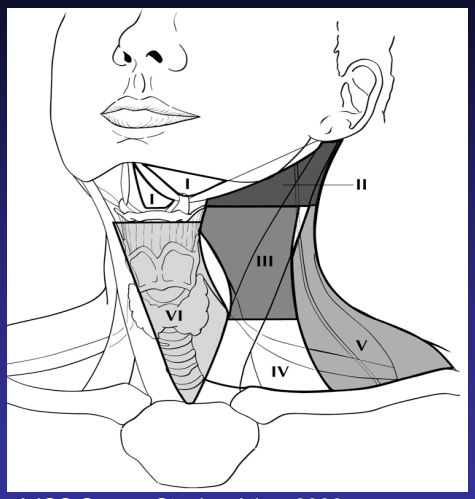
Reference:

1. Wittekind CH, Sobin LH, Henson DE, Greene F. *TNM Supplement: A Commentary on Uniform Use.* 3rd Edition, New York, NY: John Wiley & Sons, Inc, 2003. ISBN-13: 9780471466666

Note: The *TNM Supplement* was published for use with the *UICC Staging Manual* and offers some explanations and examples to answer questions about staging.

Lymph Node Levels for Head and Neck

- I Submental and submandibular
- II Upper jugular
- III Middle jugular
- IV Lower jugular and supraclavicular
- V Superficial cervical
- VI Anterior compartment (prelaryngeal, paratracheal)
- VII Upper mediastinal (not shown)



AJCC Cancer Staging Atlas, 2006.
Used with permission.

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Let's talk about regional lymph node coding for the sites we've reviewed so far. About 1/3 of all of your lymph nodes are in the head and neck area. The levels of regional lymph nodes were developed by Memorial Sloan-Kettering Cancer Center and have been adopted by the AJCC, UICC, and the American Academy of Otolaryngology. There are actually two different networks of chains: superficial and deep cervical. Superficial nodes drain the skin of the head and neck region. Deep cervical nodes drain the mucous membranes of the head and organs such as the thyroid.

The surgeon and/or pathologist should note the levels coded in the CS Site Specific Factors, and there is an illustration in your AJCC manual.

•Level I includes the nodes under the chin—submental and submandibular

•Level II includes jugulodigastric

•Level III includes jugulo-omohyoid

•Level V is also known as dorsal cervical. Level V has been subdivided into 5A (top 2/3) and 5B, with the dividing line being the cricoid cartilage.

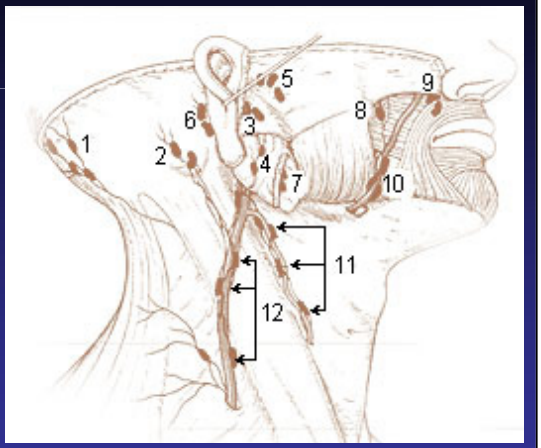
•Level VI also includes perithyroidal, precricoid, delphian. The last three are between the carotid arteries.

•Level VII are lymph nodes in the superior mediastinum, which are regional only for the thyroid (not shown).

Head and Neck Lymph Nodes: Other

- Listed in SSF 3 – SSF 6

1 Occipital
2 Mastoid
3, 4, 7 Parotid
5, 6 Auricular
Facial (8 Buccinator, 9 Nasolabial, 10 Mandibular)
11 Jugular (Level II)
12 Cervical (Level V)
Parapharyngeal*
Retropharyngeal*
* not shown



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This image from the SEER training Web site is useful for the Collaborative Stage. These are additional lymph nodes that might be mentioned and are included in the *CS Site Specific Factors*. But we don't see these normally noted within the Levels seen on the previous slide.

You might want to print out a copy of both of these illustrations to keep handy in your staging manuals.

Relationship Primary to Nodes

Submental (level I)	Anterior alveolar ridge, FOM, lower lip, anterior tongue
Submandibular (level I)	Maxillary sinus, nasal cavity, oral cavity, submandibular gland
Level II	Nasal cavity, oral cavity, parotid gland, pharynx
Level III	Larynx, oral cavity, pharynx
Level IV	Cervical esophagus, hypopharynx, larynx
Level V	Nasopharynx, oropharynx
Level VI	Cervical esophagus, larynx (glottis, subglottis), pyriform sinus (apex), thyroid

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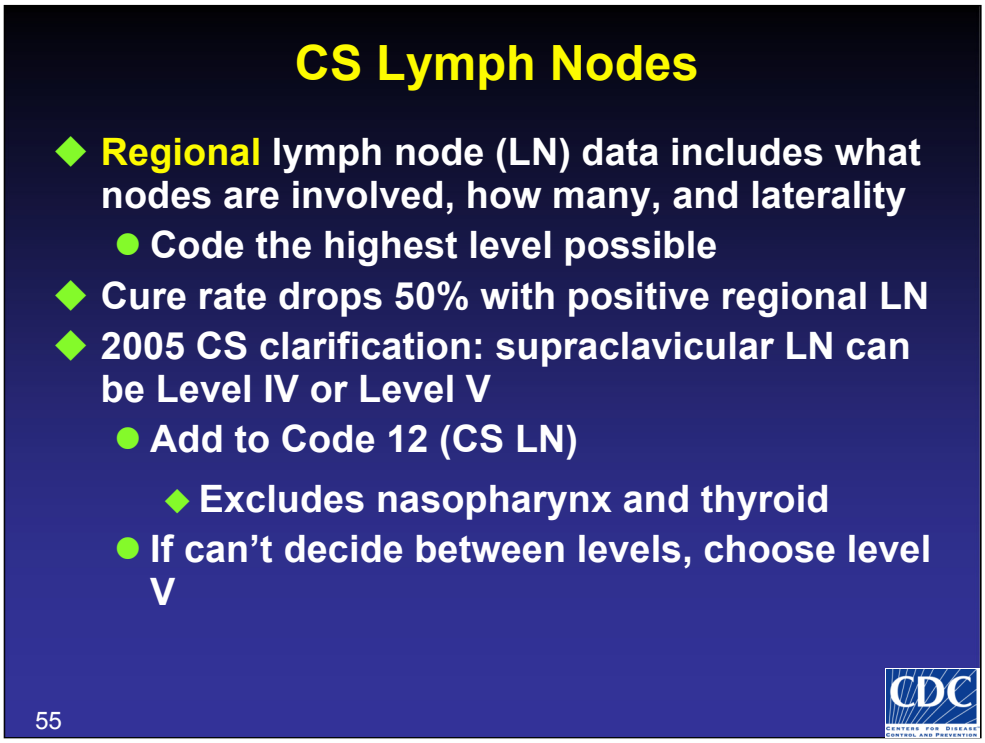
The left column lists the lymph nodes at high risk for metastasis from the sites in the column on the right.

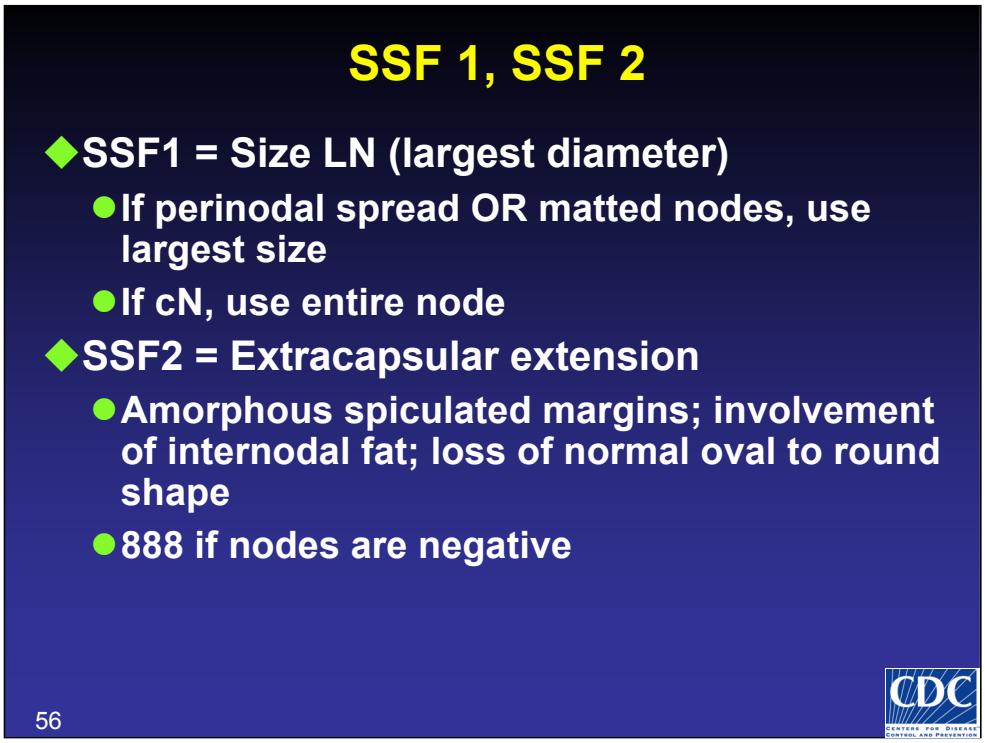
Reference:

1. Myers EN, Smith MR, Myers J, Hanna E. *Cancer of the Head and Neck*. 4th edition. New York, New York, Saunders, 2003. ISBN-10: 0721694802; ISBN-13: 978-0721694801



If you have to choose between multiple levels to describe the lymph nodes involved and you have specific information about the levels, code to the one that includes the highest named lymph node. For example if positive left Level I nodes is code 11 and left Level VII nodes is code 12, choose code 22 (multiple positive ipsilateral nodes listed in code 12).

In 2005, notes were added for us to try to code the supraclavicular nodes more specifically, when possible. Now that we're using the 2007 version of Collaborative Stage, that should be old news. But if you are analyzing older data, that could be an important distinction to review.

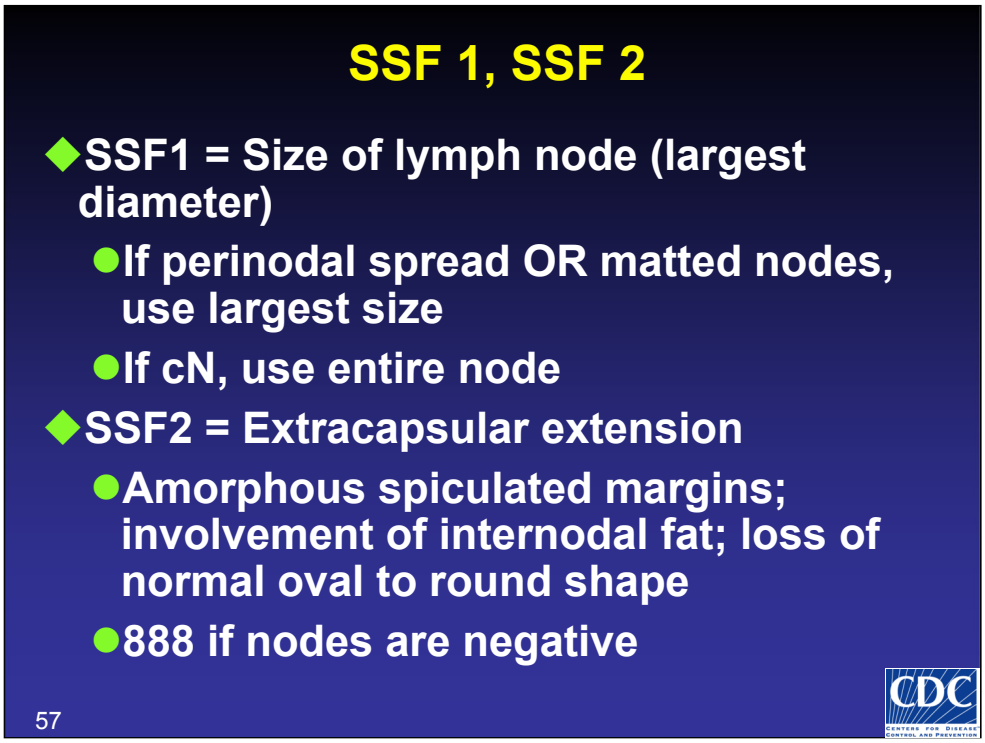


Code the size of the NODE, not the size of the metastasis. This general definition of size came from the *TNM Supplement, 3rd ed*.

Extracapsular extension can be clinical or pathologic (pathologic takes precedence). Amorphous, etc., are statements that might indicate extracapsular extension if you see it on a radiology report.

Reference:

1. Wittekind CH, Sobin LH, Henson DE, Greene F. *TNM Supplement: A Commentary on Uniform Use.* 3rd Edition. New York, NY: John Wiley & Sons, Inc, 2003. ISBN-13: 9780471466666

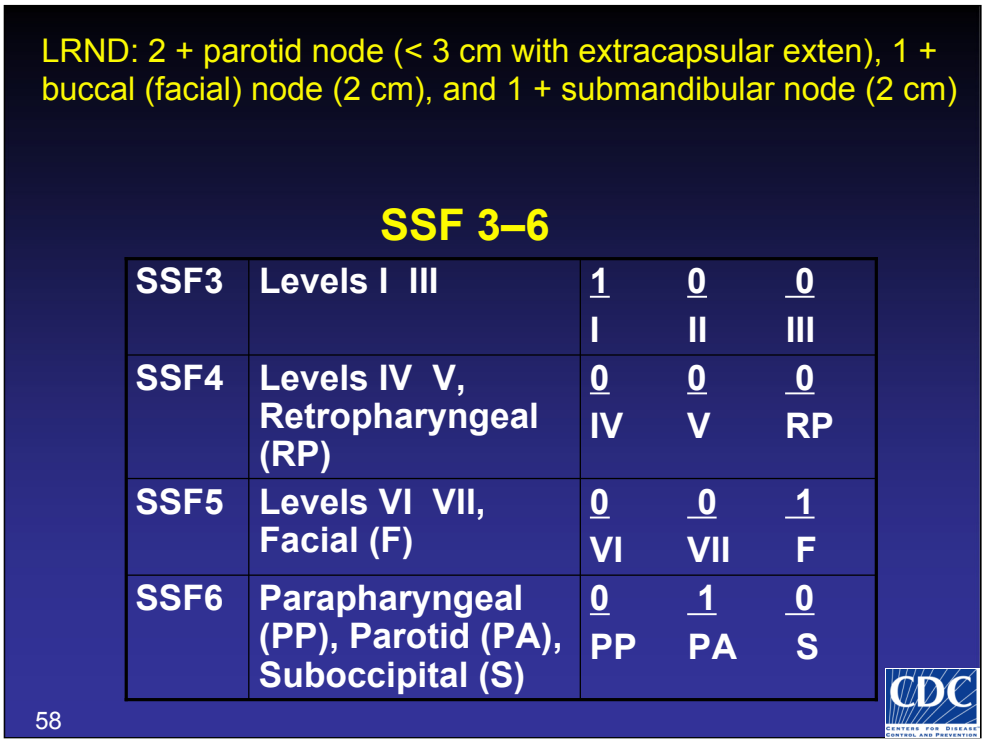


Code the size of the NODE, not the size of the metastasis, according to the title of this field. (Note that other chapters such as testicular cancer look at the size of the metastasis within the node, but that is described by the title and instructions.) This general definition of size (e.g., matted, perinodal spread) came from the *TNM Supplement, 3rd edition.* The size of the lymph node is needed so the computer can derive the AJCC node status. A note in the "Introduction to Head and Neck" chapter in the *AJCC Staging Manual* states that lymph nodes over 3cm may not be single nodes, but rather confluent nodes or involvement of neck's soft tissue.

Extracapsular extension can be clinical or pathologic (pathologic takes precedence). Amorphous, loss of normal shape, and other terms are statements that might indicate extracapsular extension if you see any of them on a radiology report according to the notes preceding SSF2 in the *CS Manual*.

Reference:

1. Wittekind CH, Sobin LH, Henson DE, Greene F. *TNM Supplement: A Commentary on Uniform Use.* 3rd Edition. New York, NY: John Wiley & Sons, Inc, 2003. ISBN-13: 9780471466666

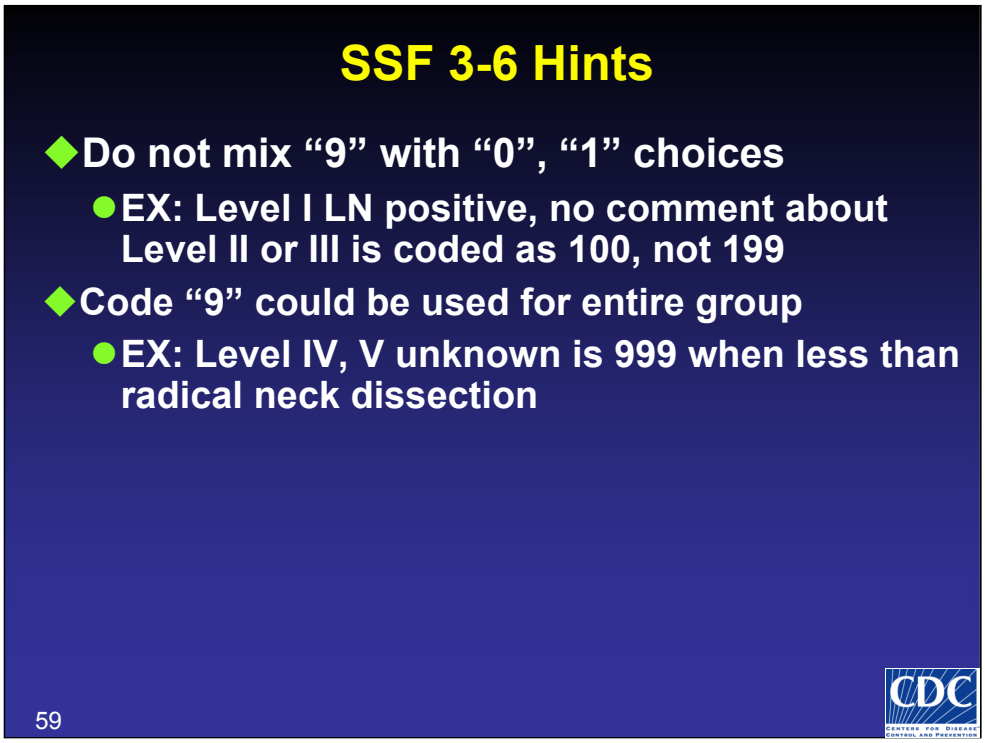


Not all levels of the lymph nodes are usually removed in a regional LN dissection, especially if it is less than a radical dissection. This example of a left radical neck dissection could apply to any of the head and neck primary sites.

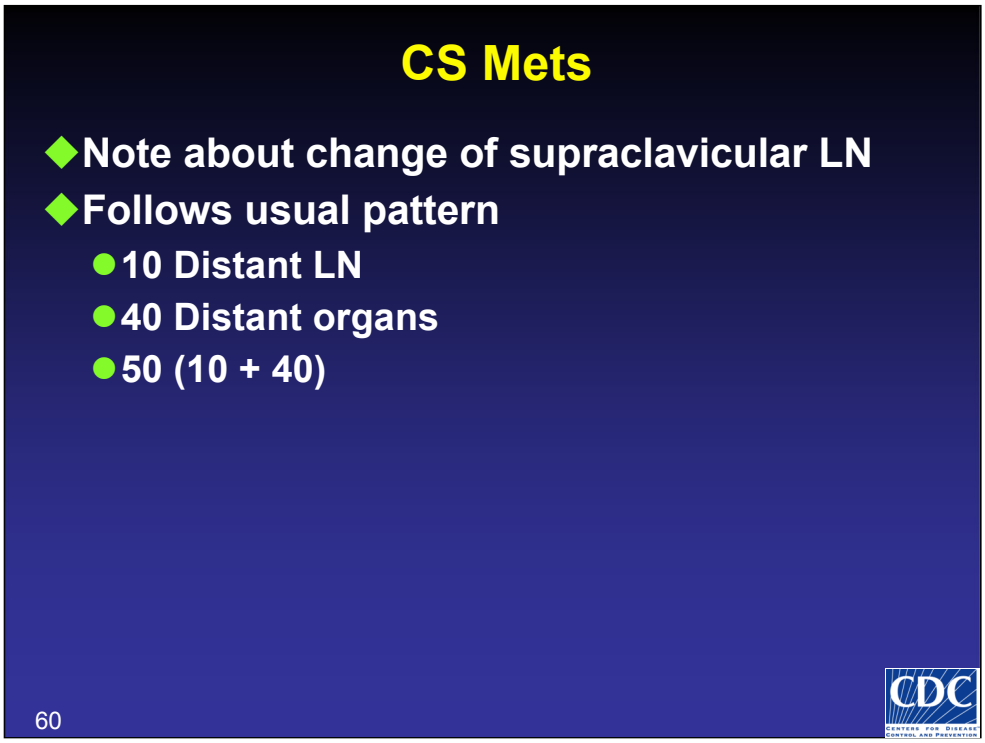
Answering “1” in the columns means yes, the LN was positive, whereas, “0” means negative or no.

We use a combination of different levels to get the SSF for each factor. For SSF 3, we review only levels I, II, and III. In the example at the top of the slide, you have positive parotid, buccal, and submandibular nodes. Submandibular is level I, so we have a positive SSF #3. The buccal or facial nerve belongs in SSF #5, and the parotid is in SSF #6.

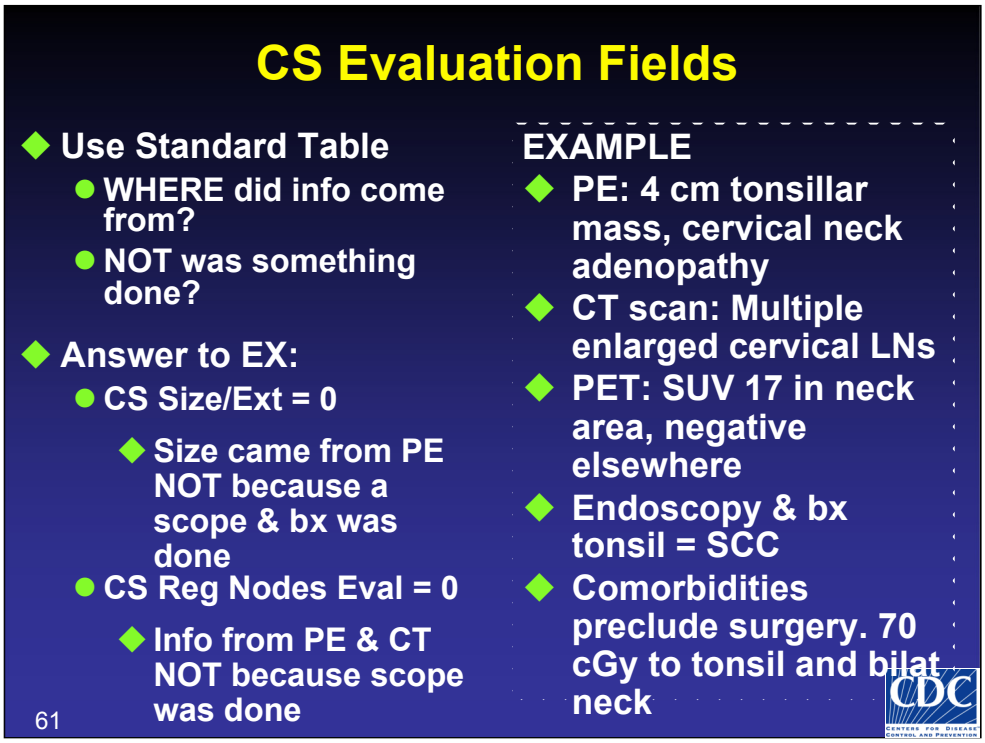
We have no nodes for SSF #4 in our sample. Logic would say that even though no LNs were documented as level IV or V, the surgeon would not skip around removing certain nodes while leaving positive nodes behind, so we may assume those nodes should be considered negative. This correlates to the instructions in Part I of the *CS Manual* that we should not use “9” for unknown in some positions when we are using “0” or “1” in the fields.



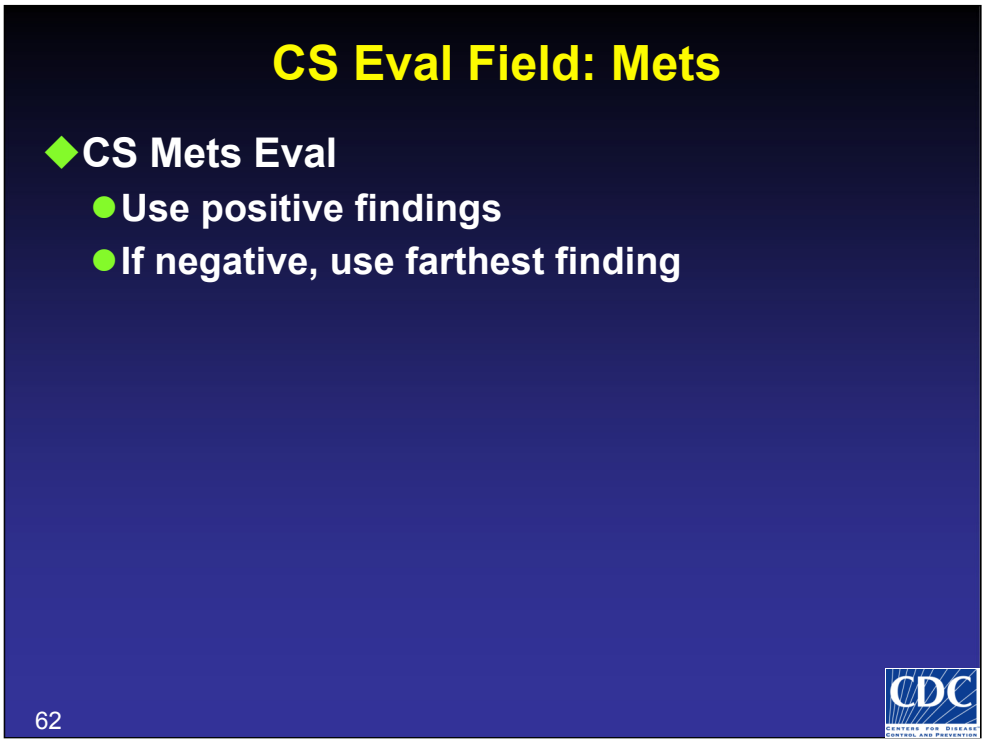
Do not mix “9” in some fields and “0” or “1” within SSF. If specific info is available for only some LNs, we can assume the others are negative within the group (per instructions in Part I).



The CS Mets at Dx field for these chapters follows the usual pattern of documenting distant lymph nodes in a separate category (10), distant organs (40), and a combination code of 50 for distant lymph nodes and distant organs.



Coding the Evaluation fields for CS are frequently misunderstood. We ALL need to go back and read the front of the *CS Manual* from page I-30 forward. We are supposed to use the Eval field to describe how we attained the information to answer the field it is related to. That means all of the pieces of information AND especially the piece of information that described the greatest tumor size or extent code.

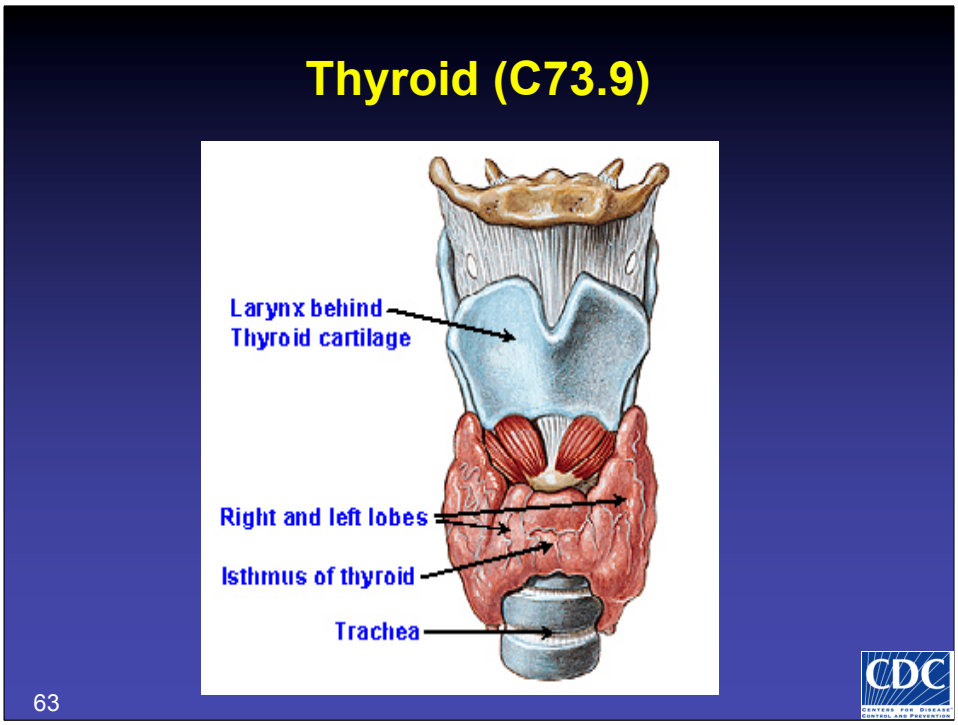


If any distant metastasis is found or suspected, how do we know about this finding?

If no distant metastases are confirmed, what was the report that confirmed the uninvolved site that was farthest from the primary cancer?

In the tonsil example on the previous slide, no distant metastases were reported. There was a scope and a biopsy, but those only deal with the primary site. There was a CT of the neck that discussed regional tissue. But the report that gave us the most reassurance that there were no distant metastases was the PET scan, which would have reported almost anywhere else in the body that disease could have been found. So the Mets Eval code would be “0” because of the PET scan.

This explanation of these evaluation fields is consistent for all of the sites in the CS book.



Before we leave the anatomy of the head and neck, we should talk about one more organ. Thyroid gland is included in the head and neck tumors because of its location, but it's an endocrine organ and we keep it separate. If you're doing a study or incidence counts for your doctors, you might want to ask if thyroid should be included.

The thyroid is the largest gland in the neck. Its function is to regulate the body's metabolism. Ninety-five percent of thyroid nodules are benign.

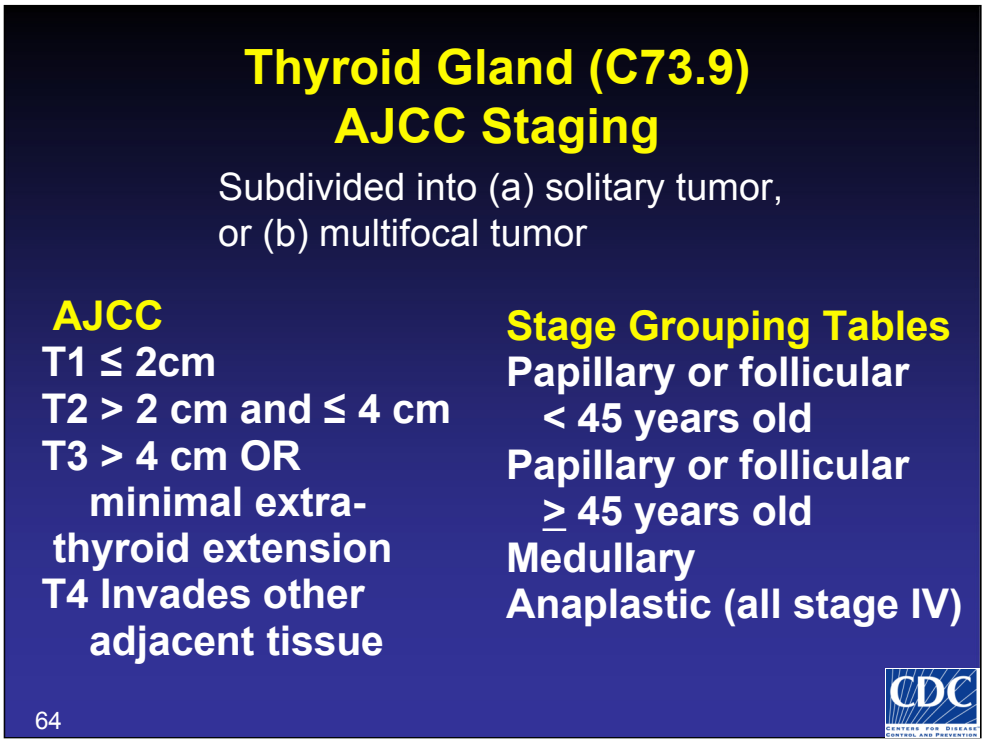
The thyroid requires iodine to create T3 and T4 hormones. Most Americans use iodized salt, which lessens the risk of goiters (1).

One of the "differences" in cancers of the thyroid is the incidence ratio. There are 3:1 female to male incidence in thyroid cancer per the American Cancer Society.

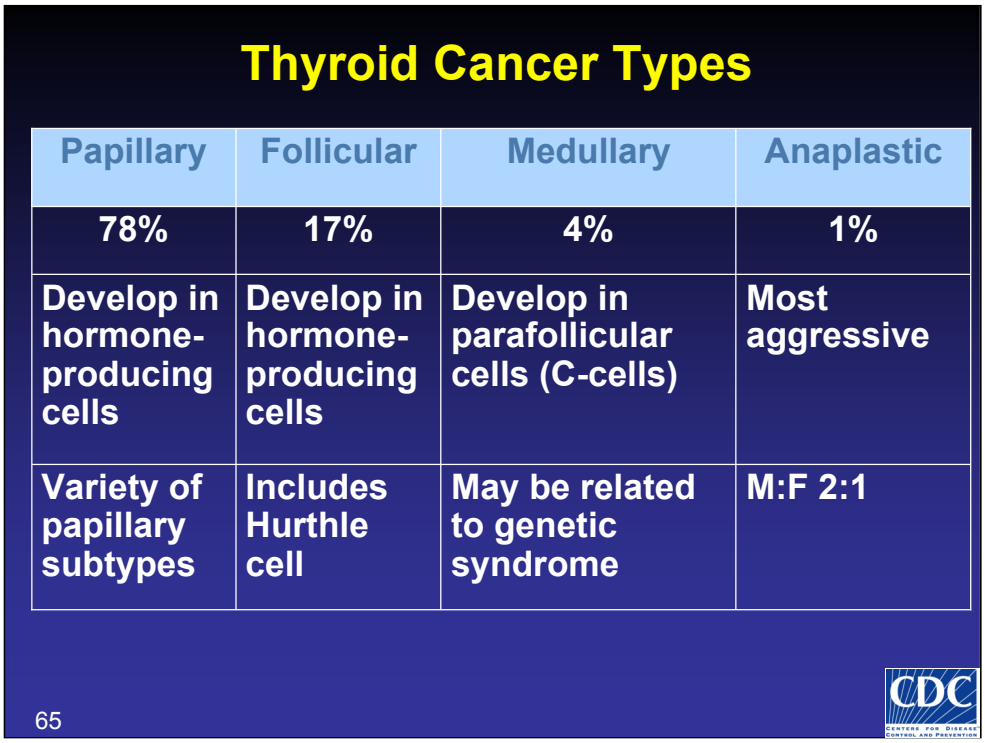
One of the more common diseases we see in the thyroid is Hashimoto's disease, and this can be documented in the path reports we see. In Hashimoto's thyroiditis, a goiter (thyroid gland enlargement) is caused by an accumulation of white blood cells and fluid (inflammation) in the thyroid gland. This leads to destruction of the thyroid cells and, eventually, to thyroid failure (hypothyroidism). As the gland is destroyed, thyroid hormone production decreases; as a result, TSH increases, making the goiter even larger. Hashimoto's disease does not guarantee the patient will develop thyroid cancer, but thyroid cancer can be found in patients with Hashimoto's disease.

Reference:

1. Shomon, M (2003). Iodine and the Thyroid. *About.com: Thyroid Disease.* Retrieved October 3, 2007 from Web site: http://thyroid.about.com/cs/vitaminsupplement/a/iodine.htm.



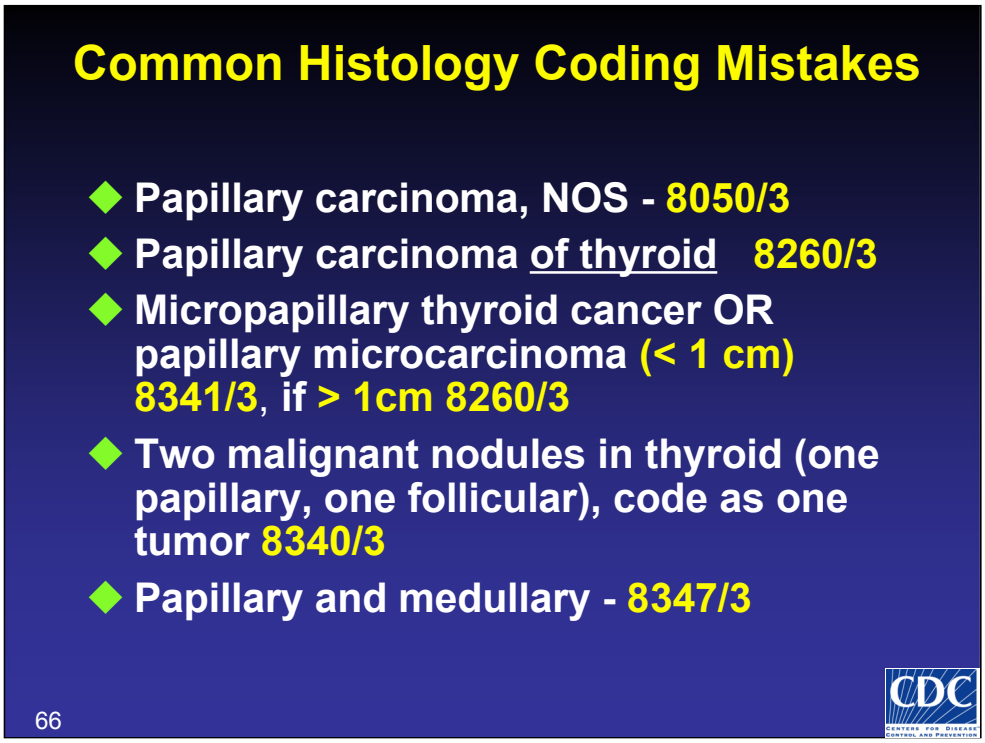
Thyroid cancer is one of the oddest to stage. The T is not so complicated because it is similar to the other head and neck sites and is based on tumor size. But the group staging is unique compared to all the other AJCC chapters because there are four different sets of stage groups depending on the histology and the age of the patient.



The majority of thyroid cancers are papillary and usually well-differentiated. Pure follicular cancers are more rare and include Hurthle cell tumors in this category. Hurthle cells (oxyphilic) are slightly bigger than follicular cells and polygon-shaped under the microscope. They can be found in other organs such as the salivary gland, parathyroid gland, esophagus, pharynx, larynx, trachea, kidney, pituitary, and liver.

The infrequent medullary thyroid cancers are 80% sporadic (randomly occurring). But 20% are related to a genetic syndrome called multiple endocrine neoplasia. If the patient is diagnosed with medullary thyroid cancer, there will be a more extensive family history and/or genetic testing recommended. (This is not the same as medullary breast cancer.) The C-cells in the thyroid secrete calcitonin, which is necessary to metabolize calcium and phosphorus.

Anaplastic is the most aggressive thyroid cancer, but luckily is very rare. The other thyroid cancers tend to metastasize to local lymph nodes and/or the usual body organs (e.g., lung, liver). Anaplastic cancer is aggressive locally and grows so fast the patient usually needs a tracheostomy shortly after diagnosis while treatment decisions are made, according to the American Cancer Society.



When the pathology reports documents papillary carcinoma of the thyroid, you must code it to papillary ADENOcarcinoma (8260) because the thyroid is a gland and made up of glandular (adeno) tissue.

Micropapillary thyroid carcinoma is related to tumor size. If all cancer in the specimen is < 1 cm, it should be coded as micropapillary, even if there are multiple lesions, as long as each is under 10mm. If anything is larger, then it reverts to regular papillary adenocarcinoma.

If there are two nodules in the thyroid but the nodules differ in histology, as long as one is papillary and one is follicular, you would code the case as 8340 (papillary/follicular combination). There is also a combination code for papillary and medullary (8347). If you find other combinations of histologies, you will need to follow the MPH rules.

Additional Resources

- www.bcm.edu
- www.pathologyoutlines.com
- Myers E, Suen J, Myers J, Hanna E. *Cancer of the Head and Neck.* 4th ed. PA: Saunders; 2003
- Harrison LB, Sessions RB, Hong WK, Mendenhall W, Medina J, Kies MS, Wenig B, O'Malley B. *Head and Neck Cancer: A Multidisciplinary Approach*. 2nd ed. PA: Lippincott; 2004

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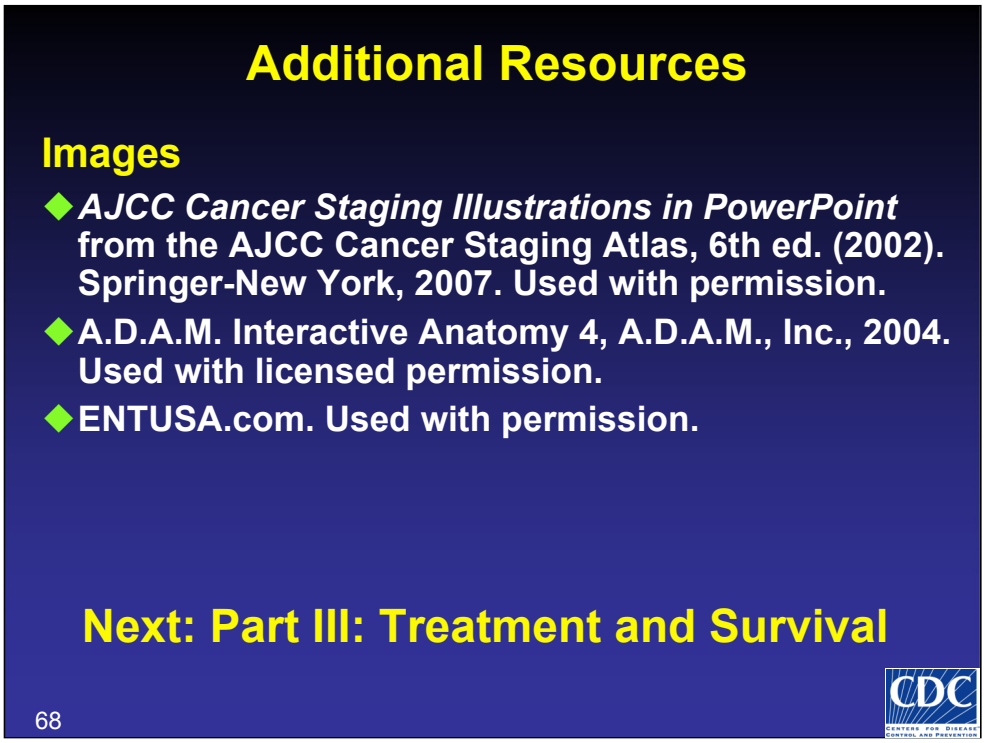
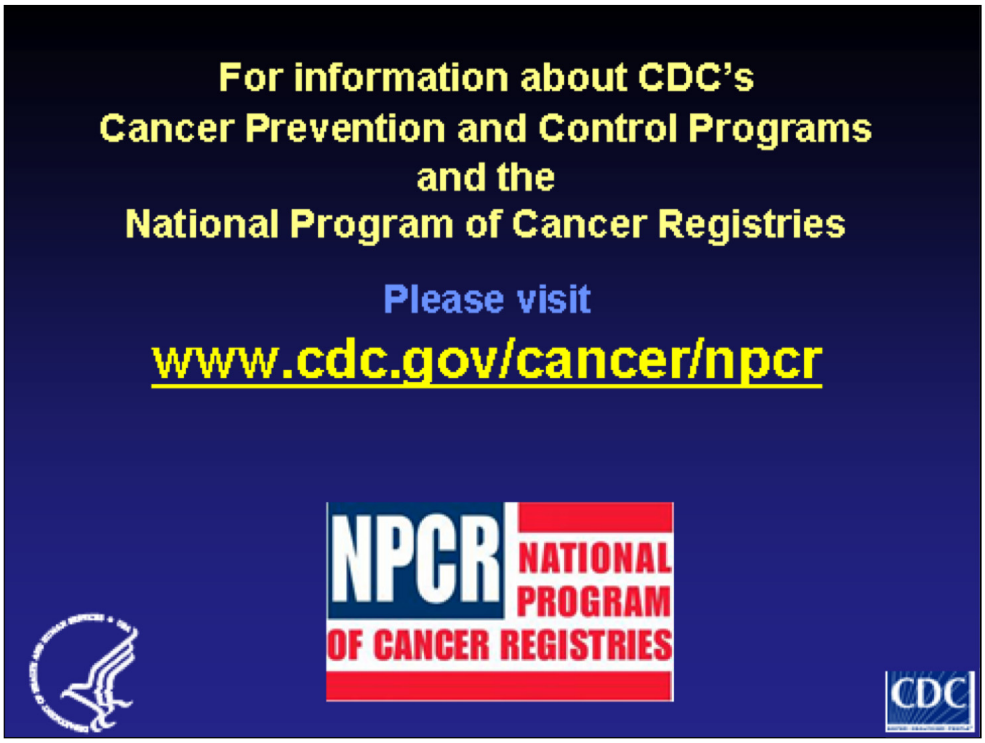
These are some additional Web sites that provided pictures and information for this presentation. These were accessed in the summer of 2007.

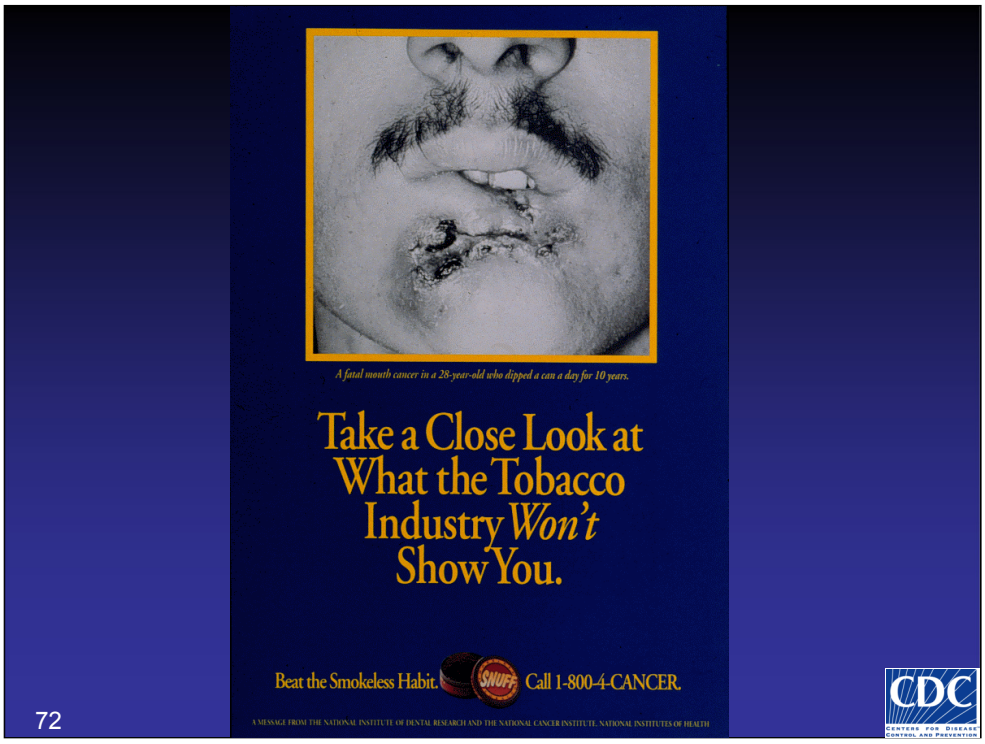


These are some additional programs that provided pictures for this presentation.

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.


For information about CDC's
Cancer Prevention and Control Programs
and the
National Program of Cancer Registries
Please visit
www.cdc.gov/cancer/npcr
NPCR
NATIONAL
PROGRAM
OF CANCER REGISTRIES
CDC

Optional Information and Graphics



This is a photograph of fatal mouth cancer in a 28-year old male who dipped a can of tobacco a day for 10 years.

In 1992, a survey reported that almost half of all the nation's pro sports players used smokeless tobacco.

The good news? A study reported in July 2006 from *Medicine & Science in Sports & Exercise* reported that the percentage has dropped to 25%. Part of this is because of education of the players and increased effort of the managers to recommend oral screenings. In 1993, minor league baseball banned the use of smokeless tobacco. And in 1994, the National Collegiate Athletic Association (NCAA) banned the use of all tobacco products, including smokeless tobacco, for coaches, game officials, and student-athletes in all sports during practice and competition. Accordingly, a student-athlete who uses tobacco products during practice or competition is disqualified automatically for the remainder of that practice or game.